

# Sharp Tools

*The Key to Improve Your Mokuhanga Carving*

*by Terry McKenna  
Karuizawa Mokuhanga School*



# Table Of Contents

Introduction	8
Sharp Tools	8
Is Your Tool Sharp?	9
How Often Do I Need to Sharpen?	10
The Best Way to Sharpen Your Tools	10
Left Hand or Right Hand Hold	11
Sharpening Equipment	12
What Type of Stone is best?	14
About Tool Steel	15
Types Of Steel	15
General Process	16
Stones and General Process	16
Grit	16
A Flow Chart of the Sharpening Decision Process	19
Progressing to Finer Grits	20
A Recommended Set	20
Sharpening Stones Set Up	21
Movement on the Stone	22
Applying Pressure to Alter Tool Shape	23
Tool Geometry	24
The Correct Shape of Your Tool	24
Common Features	24
Standard Shapes	25
The Geometry of Individual Tools	26
The Bevel	27
The Burr	28
Some Tool Profile Comparisons	29
Flat Blades	30
Sharpening Techniques	30
Tips for the Beginners	36

Copyright © 2021 Terry McKenna.

All rights reserved.

Design by Karuizawa Mokuhanga School

No part of this book can be reproduced in any form or by written, electronic or mechanical, including photocopying, recording, or by any information retrieval system without written permission in writing by the author.

Published by Karuizawa Mokuhanga School

〒 389-0104 Japan, Nagano-ken, Kitasaku-gun, Karuizawa-machi, Karuizawa Higashi 18-7

Learn More about Mokuhanga - [www.mokuhanga-school.jp](http://www.mokuhanga-school.jp)

Although every precaution has been taken in the preparation of this book, the publisher and author assume no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of information contained herein.

ISBN 978-4-9912079-1-4

The Aisuki or Clearing Chisel	37	Some Items To Make Yourself	68
Chasing the Burr	38	A Wooden Slip Form	68
The Knife - Advanced Considerations	39	Carborundum Paper	68
Left and Right-Hand Bevels	39	Stone Holder	69
An Additional Bevel	39	Suppliers	70
Different Angle for Different Cuts	40	In Your Own Country	70
Removing and Replacing the Knife Blade from the Handle	40	Buy Direct from Japan	71
Gouges	42	If You are Visiting Japan	71
Tips for Beginners	46	Left-Hand Hold Photographs	72
Removing the Blade from the Handle	47	About the Author	75
Tips for Beginners	49		
Major Surgery on a Small Gouge	49		
Gouges and Chisels to use with a Mallet	50		
V-Chisels	52		
A Difficult Tool to Sharpen	52		
Tips for Beginners	55		
Other Tools	56		
Leather Strop and Machines	56		
The Leather Strop	57		
The Problem with using a Leather Strop	57		
Using Sharpening Machines	59		
Safety Warnings	59		
Types of Machines	59		
Using Machines Successfully	61		
Polishing	63		
Stone Care	64		
Maintain Your Stones	64		
Flattening Stones	64		
Cleaning and Drying Stones	67		
Cleaning an Oil Stone	67		
Storage	67		
Appendix	68		

**Acknowledgements**

Special thanks to Richard Steiner, the author’s mokuhanga teacher, to Leon Sadubin, Australian Master Woodworker (<http://www.leonsadubin.com.au/>), for reviewing this manual and giving valuable feedback, and to Laurens Otto, Master Woodcarver, who introduced me to Belgian Broche sharpening stones.



# Introduction

## Sharp Tools

Carving with truly sharp tools is a pleasure.

The soft hissing noise as the tool cuts, the crisp and clean cut, and wood chips coming away is doubly pleasurable. The sights, sounds and ease of working are the first pleasure, and then the knowledge that you are producing good work is the second.

Having sharp tools and knowing how to keep them sharp is a key skill that will help you produce better carving for your mokuhanga, as well as saving you time and effort. Sharp tools cut cleanly and disturb the uncut wood far less, enabling you to successfully complete more detailed projects. Apart from understanding wood grain, there is no other single factor that will improve your carving more. A Japanese master woodblock carver that I know tells the story of his teachers coming to inspect his progress. All they looked at were his tools, to see if they were sharpened properly! This would tell them that he knew what he was doing.



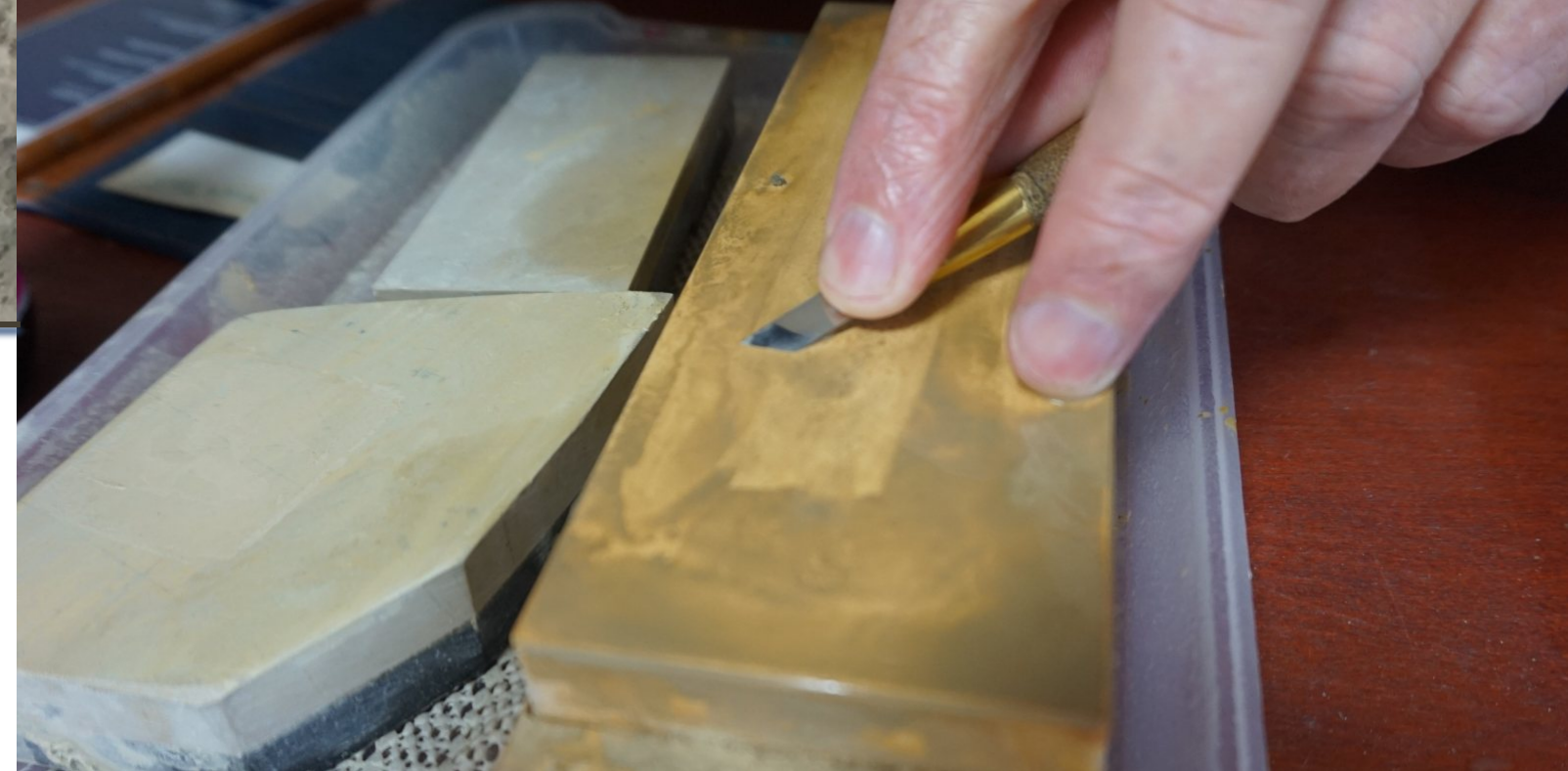
This manual has been written to give you a comprehensive view of techniques for sharpening tools specifically for mokuhanga. These techniques also apply to lino-cutting tools, as many of the shapes are the same. The techniques included are a blend of Western and Japanese woodworking techniques applied to the particular tool shapes of mokuhanga carving tools.

Despite their differences, both Japanese and Western woodworking traditions have a long history and share many characteristics. A major difference however, is that Western woodwork tool sharpening is based on using oil with stones (with some exceptions) and Japanese primarily with water stones.

Mokuhanga tools have some characteristics that makes sharpening them slightly different from general woodwork tools, although the fundamental process is the same. The same process and stages are used whether your sharpening is with oil stones or water stones.

Each chapter in this sharpening manual covers a different aspect, from equipment, general process, specific tool geometry to maintaining your stones. Having well sharpened tools is one of the key skills to acquire for successful, high quality carving, and acquiring the skills of sharpening definitely helps you to create more accomplished work.

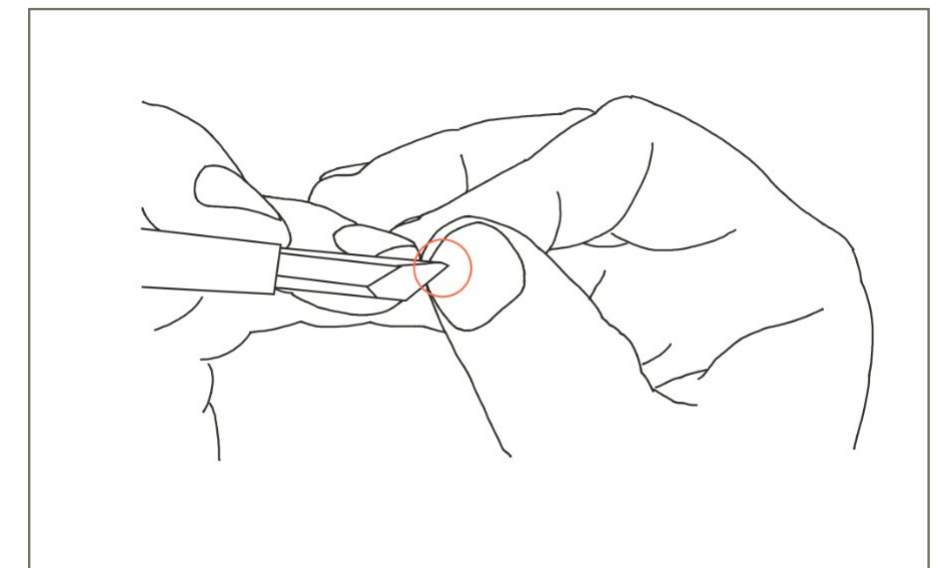
The techniques in this manual are what the author has developed over the years, and are not necessarily the only way to sharpen your tools, or to be considered “authentic” Japanese techniques. You may, in your own practice, develop techniques that work better for you. I encourage you to develop these skills as they will make a difference to the end results of your artwork



## Is Your Tool Sharp?

An easy way to quickly check the sharpness of your tool before you start work is to gently rest the cutting edge on your thumbnail or fingernail. With just the weight of the tool (no pressure) move the tool a little. If the tool grips in your nail then it is sharp. If the tool however, slides around then it is not sharp enough to give you good results. This is a quick and reliable way to check your tools before you touch the wood.

Caution - This method has a risk that you might cut yourself, so alternatively a small scrap of your carving timber can be used as a test. If you cut across the grain, then a sharp tool will cut cleanly with little effort, while a blunt tool will be harder to push and leave broken or kicked-up fibres of wood. You can also use a blank area of your board that will later be carved away if a scrap is not handy.



At any time, as you are carving, you may notice that the cut is not clean, or it is becoming harder to cut the wood (usually both!). Then it is time to stop and sharpen your tools. If you persist with a blunt tool then, as well as not carving as crisply, you increase the chance of your timber breaking out.

If your tool is damaged, or seriously blunt, you will be able to see this by looking carefully at the cutting edge. The three photographs on the following page are examples.

## Visual Signs of Sharpness

A badly worn or damaged tool is easy to identify just by looking closely at it.



*The tip is chipped at the very end. Sometimes there may be a chip along the cutting edge.*



*The shiny line at the cutting edge shows that the bevel is rounded over, and the tool is not as sharp as it could be.*



*This knife is in good condition, with a flat, polished bevel, un-chipped edge and no indication of rounding*

The two knives on the left will continue to cut, but the truly sharp knife on the right will give much better performance.

## How Often Do I Need to Sharpen?

This depends on the quality of your tools, the hardness of your wood and the amount of work you are doing. There is no set time, it is always “as soon as my tools are starting to lose their edge”. I hone my knife tools sometimes for every block when it is delicate or detailed work. Sometimes with a larger, or complicated block I will sharpen more than once before finishing. My gouges might last several blocks of shina, which is relatively soft wood. A beginner might last several projects before attempting to sharpen their tools. As you progress, you will sharpen your tools more often as you gain better understanding of the relationship between quality carving and sharp tools.

A student tends to persist with blunt tools, while a professional will not even start, unless their tools are properly sharp, and will stop carving to keep them sharp as often as they need. The professional carver clearly understands the relationship between sharp tools, efficiency and quality workmanship.

## The Best Way to Sharpen Your Tools

*“The best way to sharpen your tools is to keep them sharp” - Anonymous*

What does the quote above mean? It means that you save time and energy by regularly “touching up” tools that are already sharp. A short, regular honing prevents you from having to do a lot of work to get blunt or damaged tools back to razor sharpness.

This small, regular maintenance is a lot more efficient than waiting until the tool is so blunt that it needs “major surgery”. The paragraph title probably got your hopes up for a straight forward, easy solution, but getting the best results in reality is a little more complicated than a simple, single solution for all your tools. This manual is intended to provide the information for you to develop your skills.

## Some terms we use in this guide:

**Sharp** – we mean the cutting edge is very fine and ready to use for carving wood.

**Blunt** – the cutting edge is rounded, chipped or malformed or all of those, and the tool is not ready for carving.

**Hone** – a light sharpening when the tool is already in good condition and the use of a fine stone brings the tool back to high sharpness

**Grind** – a heavy sharpening on the stone, removing metal to improve the shape of the tool

**Sharpen** – the overall process of making the tool ready for use

**Refine** – similar to hone, the tool is in good shape but we do a little to make it even better

**Stones** – any type of stone that you are using for sharpening, depending on which you own

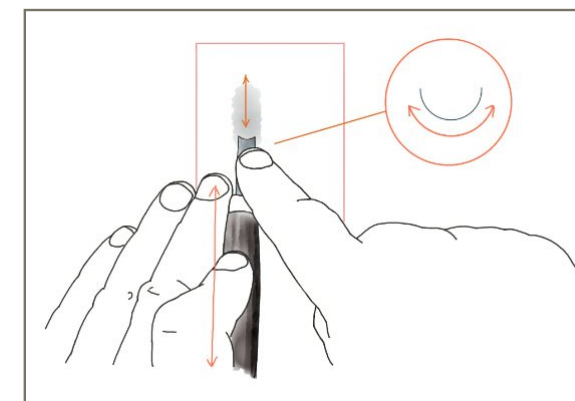
**Shape** - the geometry of the tool, with the combination of its different facets.

**Profile** – the shape of the cutting edge

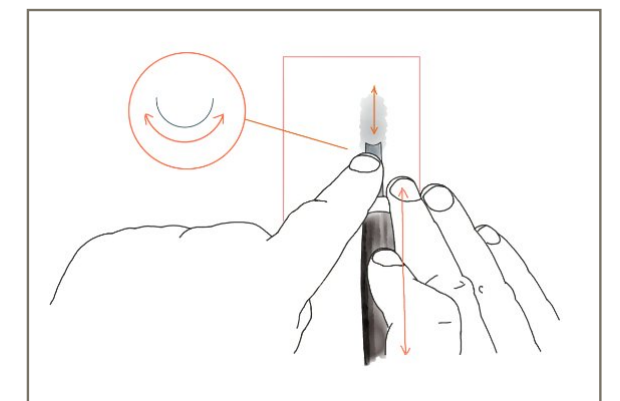
**Flat** – two things, the first being the flat side of the blade, the second meaning a perfectly even surface with no curves or facets

## Left Hand or Right Hand Hold

Most of the illustrations in this manual are shown as a right-hand method of holding the tool. Actually, I’m naturally a left-hander, so the original illustrations have been flipped to suit right-handed readers, who are in the majority. I’ve included an appendix with the original, left-handed illustrations for my left-handed colleagues to use as a reference.



Left-handed hold



Right-handed hold

You will find your own ways to hold the tools, so don’t worry if what feels comfortable to you is different to what is pictured. As long as you understand the principles of where to hold, and where to apply pressure, and how to move the tool, you will sharpen your tools effectively.



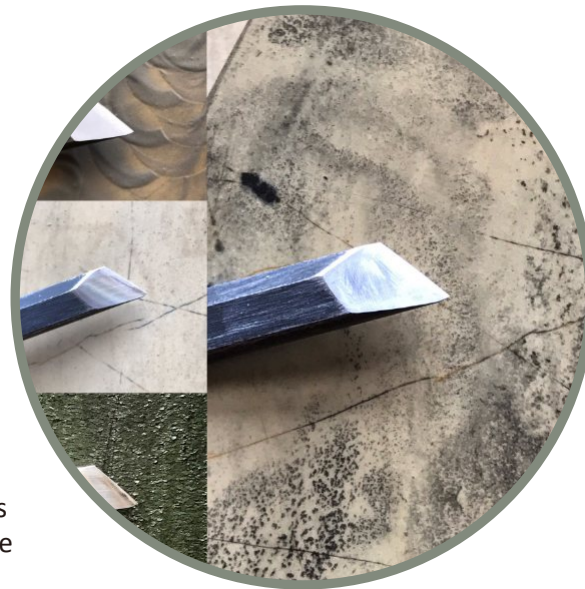
# General Process

## Stones and General Process

This section outlines some fundamental aspects of the materials and techniques, upon which sharpening your tools is based. Later we will look at specific instructions for each type of tool, but this chapter gives you the basic knowledge of the tools and processes you will need to grasp.

### Grit

Grit refers to the degree of roughness or fineness of the abrasive particles of any sharpening equipment, stones or papers. I assume you are familiar with sandpaper, where a number tells you how rough or fine it is, for example #80 sandpaper is very rough while #400 sandpaper is very smooth. The higher the number is, then the finer and smoother is the result. These numbers come from several international standards, the details of which are complicated and of no relevance to the practical task of sharpening your tools.



For tool sharpening, grits in the range 200 – 400 are classed as “rough” 600 to 800 are classed “medium” and 1000 – 1500 are classed “fine”, while above these are considered very fine.

Japan uses three words to describe the grades of stone:

荒砥 Ara-to - Rough

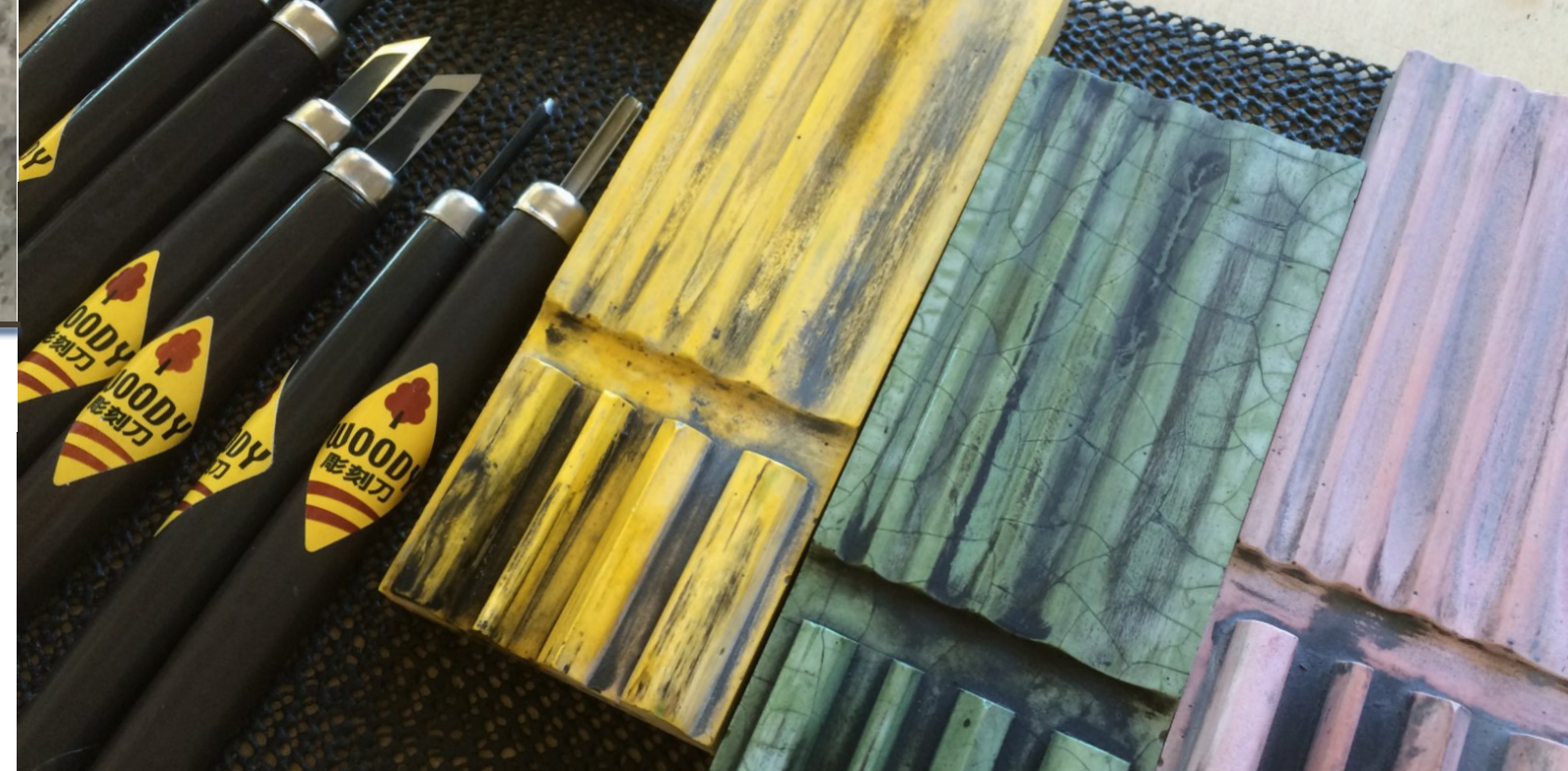
中砥 Naka-to - Medium

仕上砥 Shiage-to – Fine

If you are buying Japanese stones, they may only be classed in these grades, not with a specific number. This is the case for natural stones, while manufactured stones will have a number to indicate the size of grit. Natural stones also may have inconsistencies in grit, while manufactured stones are quite regular in their grit size.

Understanding the relationship between grit size, abrasive power and fineness of finish is fundamental to successful sharpening. Rough grits make larger scratches, grind more steel away and leave a rougher finish. As grit size decreases, so the scratches get smaller and the finish finer. Very fine grits leave scratches that are not distinguishable by eyesight, so the steel looks highly polished. Under magnification, however you could see the scratches from very fine grits.

What this means in practise is that you will choose a grit size to perform the sharpening function that is needed for your tool. For a damaged tool, or very blunt tool that needs a larger amount of steel removed to return the tool to its optimum shape, then a rough grit is the most efficient choice. For a tool that is already in good condition, then a fine grit is what is needed to remove a thin layer of steel to hone the edge of the

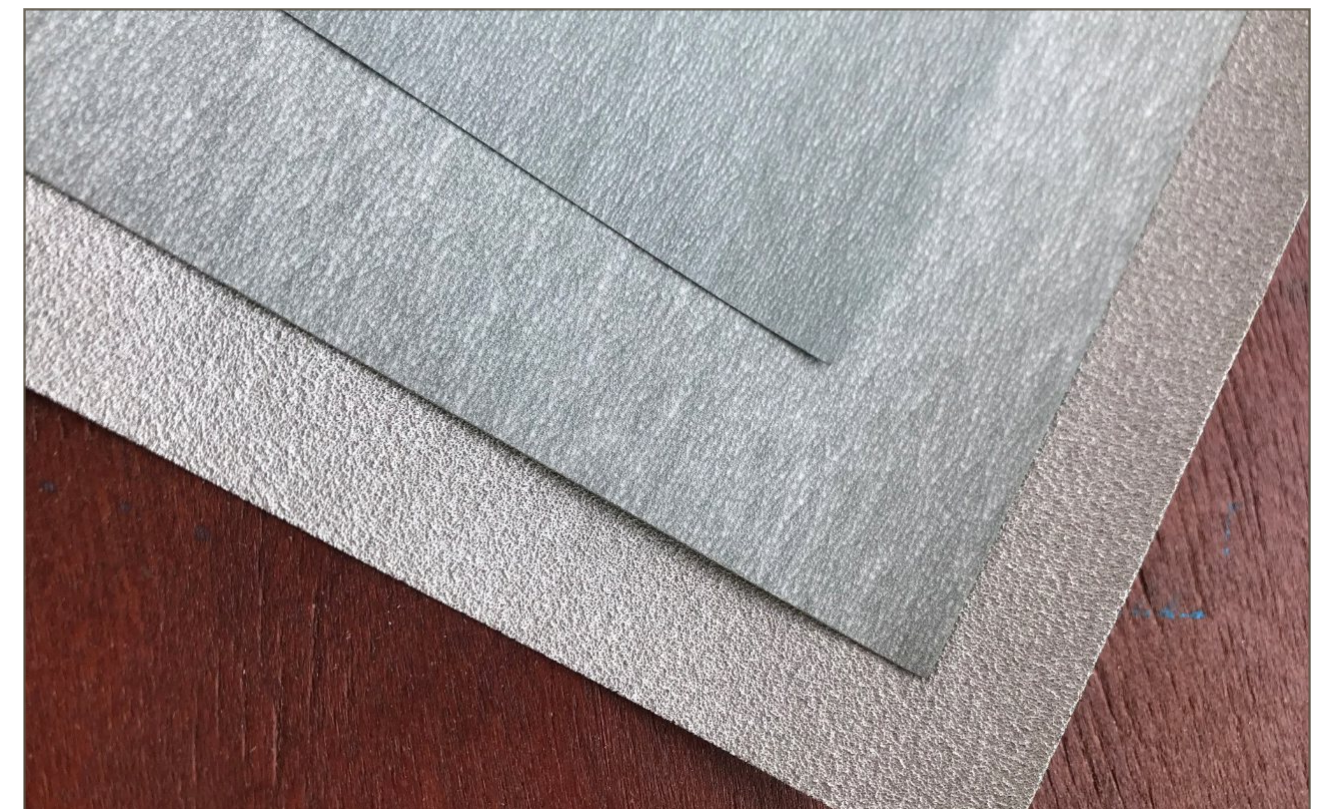


tool, bringing it back to a sharp cutting edge.



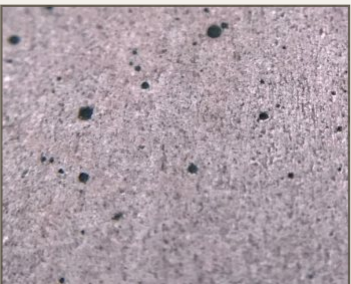
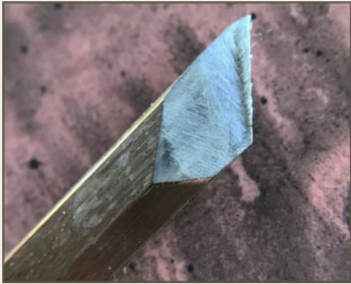



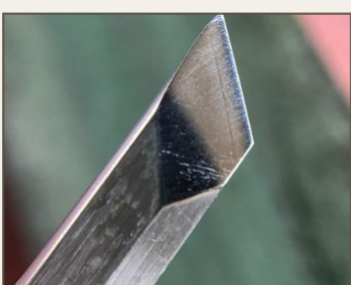
The following pages give some examples of different grit sizes and the result obtained from them, as well as a decision making flow-chart about what starting point you might choose in different situations.

The application of grit size is the same for all tools, and is independent of the tool geometry, which is covered in the next chapter.

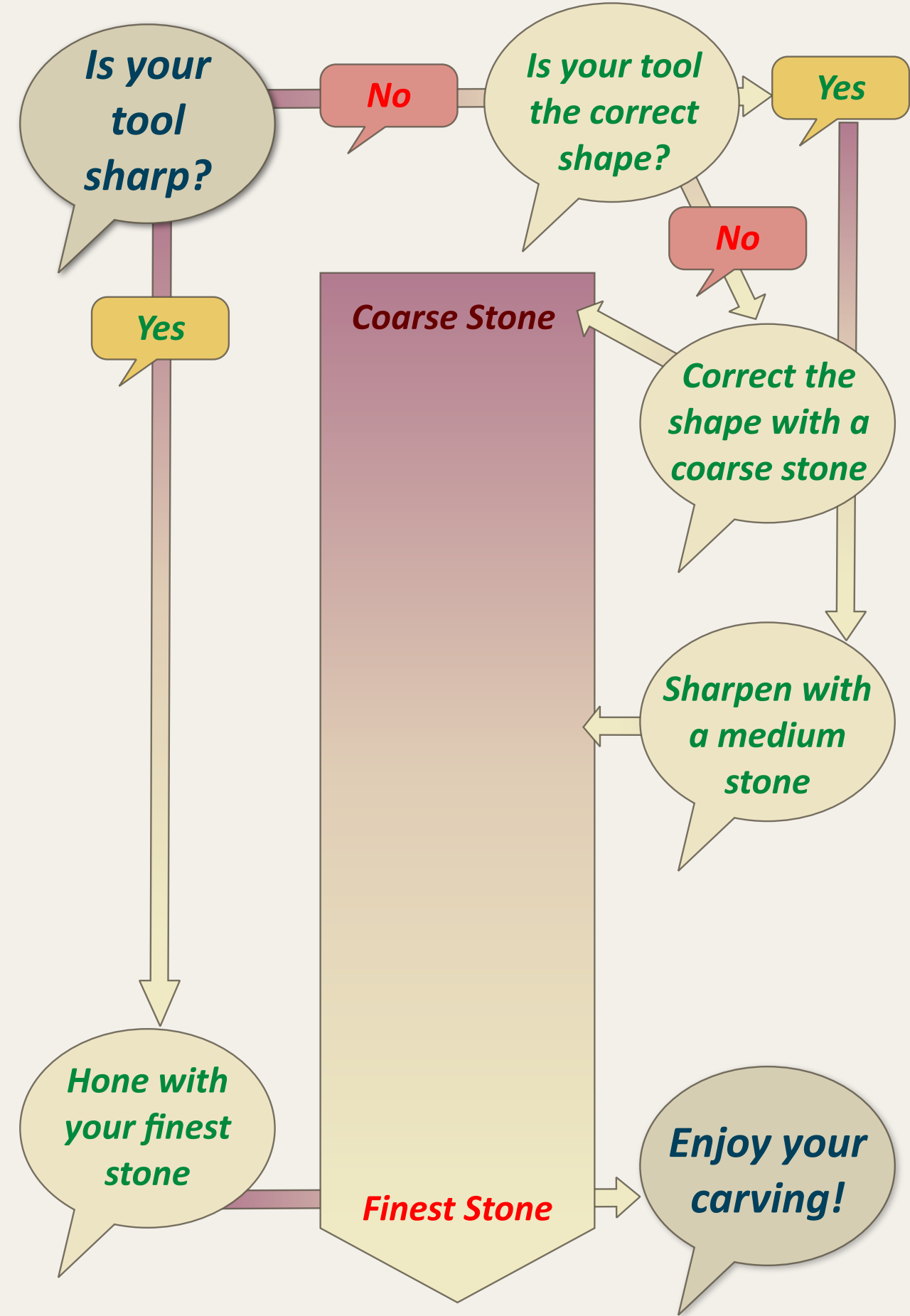
*Below: Some sandpapers with different grits: rough, medium and smooth.*





Here are some examples of different grit stones and the finish resulting from them:		
	<p><b>#400 Diamond plate</b> – used for rough shaping of the blade and very fast removal of steel. Also used for dressing the other stones to keep them flat. Tends to be too aggressive on the tool if not used carefully, and will leave deep scratches.</p>	
	<p><b>#300 Ceramic stone</b> – rough shaping and repairing, relatively fast removal of steel. You can clearly see the scratches on the tool blade from this stone.</p> <p><i>Not yet sharp enough to carve with.</i></p>	
	<p><b>#1000 Ceramic stone</b> – refining the edge. A tool sharpened with this will cut, but a sharper edge is better. This stone refines the tool surface, removing the larger scratches from the previous stone.</p>	
	<p><b># 1500 Ceramic stone</b> – fine, sharp edge, good for cutting. Refining the blade even further, this stone gives a finely polished blade and sharp cutting edge.</p>	
	<p><b>#6000 Ceramic stone</b> – a razor sharp edge. This stone hones the blade to a very sharp edge, which gives a fine, smooth cut.</p>	
	<p><b>Polishing compound</b> – (#30,000 to #50,000) very fine polish. The fine particles are suspended in hard wax. Only useful on an already sharp blade, it creates a mirror finish, which helps the tool slide through the wood while cutting.</p>	

A Flow Chart of the Sharpening Decision Process





# Flat Blades

## Sharpening Techniques

Flat Blades are all tools with a flat back of the blade, even though the bevel may be at different angles or profiles. Tools with formed blades, such as gouges, are covered in later chapters.

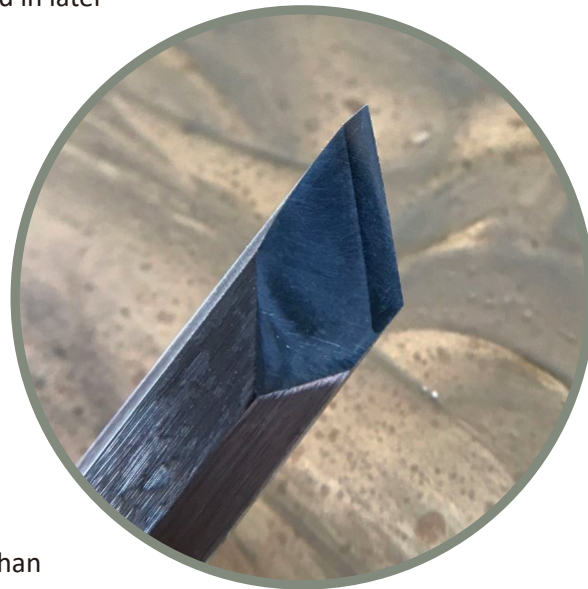
Flat blades include: kentou chisel, knife tools and aisuki (clearing chisel). The process for sharpening these is essentially the same, with the aisuki being slightly more difficult as it has a slight curve on the bevel.

The process covered here is the foundation of sharpening all your tools, dividing your efforts between the back of the tool, which you aim to keep perfectly flat, and the bevel, which is where most of your work will be done. Depending on the condition of your tool, for example it is badly chipped, you may need to start with a rough stone to correct the shape of the tool, before proceeding to finer stones. This decision of what grit to begin with is the same for all types of tools, including gouges and tools with formed blades, rather than flat blades alone.

The process of sharpening flat blades is the foundation of all sharpening. If you can master this process, then you can sharpen any tool. Start learning to sharpen with flat tools, as they are easier than the tools with formed blades.

In mokuhanga, the knife tool is the most important tool as it defines the edges of all the colour areas, so having a properly sharp knife is a critical part of successful mokuhanga. This is especially so for key blocks, lines and fine details, where the outcome depends on both the skill of the carver and the sharpness of the blade they are using. A sharp blade requires less force to cut, and will not disturb the structure of the wood as you are cutting. This then leads to less break-outs of details and lines, and a better, crisper result overall.

In this section we will look at the basic process for sharpening flat blades, starting with the knife. We will also show some advanced geometry for the knife, including alternative knife angles, and how to sharpen the curved bevel on an aisuki. The illustrations mostly show the knife being sharpened as examples, but apply the same steps to kentou chisels and aisuki.



## Process

### Inspect the Tool

Look carefully at your tool and decide what you need to do. Is it the correct shape, or does it have faults that need correcting?

- Is it chipped or damaged?
- Does it just need honing on the finest stone?



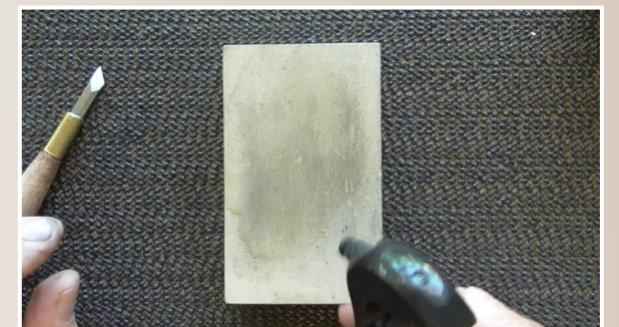
The degree of damage or imperfection will determine at what grit you need to start. Refer back to the section on Grit, to choose, if needed.

The knife tool just above has chipping along the cutting edge. We will need to grind the bevel back until all these chips have disappeared, and we have a fine, flat edge and bevel. The knife tool on the right is in good shape, but just needs honing on finer stones to get a really sharp edge again.



### Select the Appropriate Stone

Choose the appropriate grit for the stage of sharpening. Wet the stone liberally (water stone) and if you have a nagura stone (optional), rub this on your sharpening stone to create a thin slurry. You can use a ceramic water stone without nagura. For an oil stone, spread light machine oil. Have a clean rag handy.



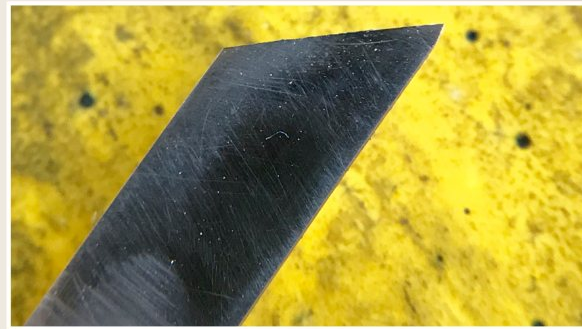


## Process

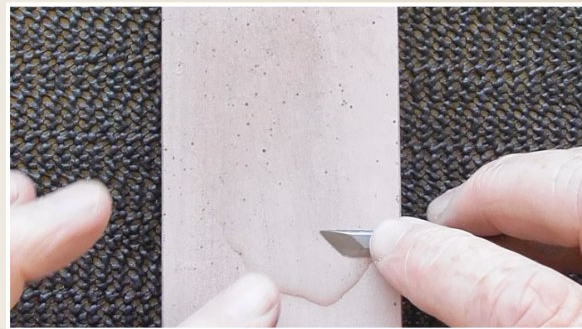
These instructions assume you will start with a rough or medium stone, and have a finer or super-fine stone to progress to.

### Step 1 – Flat Side of the Blade

Start with the flat side of the blade. We want to make sure this side is perfectly flat. If you know that this flat side is already in perfect condition, you can skip this step, and proceed with the bevel side.



Lay the flat side gently on the stone, make sure the blade sits perfectly flat against the stone. Raising the handle, even the smallest amount, will create a curve, or bevel on this flat side. The handle usually will restrict you to using one half of the stone. Use the fingers on your other hand to apply pressure on the blade. Your fingers can be gently curved around the handle, but all the focus of holding the blade is on the part against the stone. Begin to move the blade, concentrating on keeping it flat.



As you move backwards and forwards, a black slurry will begin to form. This is tiny particles of steel that have been ground away.

Position your fingers in whatever way feel comfortable to you, as long as the blade continues to be flat against the stone, as you move it backwards and forwards. Include small circular motions if possible, still keeping the blade perfectly flat on the stone.



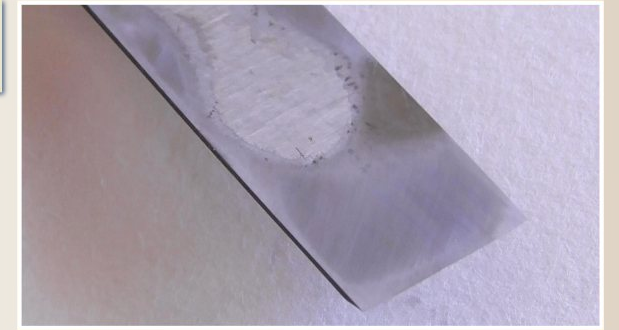
Stop every dozen strokes or so, wipe the blade and inspect it. You should see the scratches from the stone you are using in contrast to the previously shiny blade.

Keep going until the entire surface is evenly covered with the same scratches. Pay special attention to the flat surface right to the end of the blade where the cutting edge is. We want a perfectly flat, even finish.



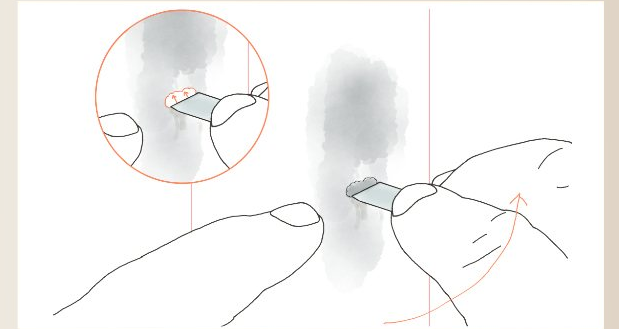
## Process

A kentou chisel is no different, keeping the blade flat against the stone with pressure from your fingers is required. You will notice that the flat side of a kentou chisel may have a shallow hollow, which makes this part of sharpening easier. We don't have to make the entire back of the blade flat, just the area close to the cutting edge.

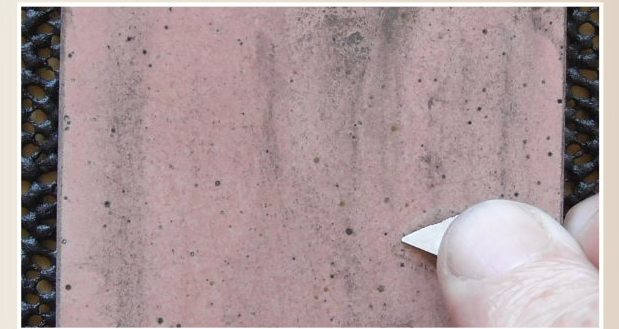


### Step 2 – Grinding the Bevel

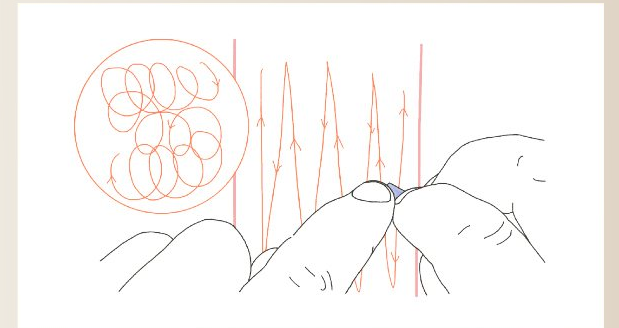
Turn the blade over to sharpen the bevel. Start with the whole length of the blade flat against the stone, and gently lift the handle, paying attention to the bevel and cutting edge. Raise the handle until you feel when the bevel sits flat against the stone, and watch for water (or oil) and slurry being pushed out the front of the bevel. When you see this, the bevel is flat against the stone.



This is the position we will keep the blade in for sharpening. Your fingers should be holding the blade and the focus of your pressure is keeping the bevel in this position, sitting perfectly flat against the stone.



Keeping the bevel flat against the stone, move the blade back and forwards, or in a circular motion, or in a combination of these, paying attention as you move that the blade doesn't change angle. This takes some practice but is an essential skill for a good result. Make use of as much of the stone as you can so that a groove is not worn in your stone. Your spare fingers can support the handle of the tool, but avoid holding the handle – have all your pressure on the blade itself.



Every dozen strokes or so, stop, wipe the blade and inspect the pattern of scratches appearing. Watch for uneven angles. We are aiming for an even, perfectly flat pattern of scratches across the entire surface of the bevel. A black slurry will form more quickly with this side, as the softer steel on top is ground more easily.

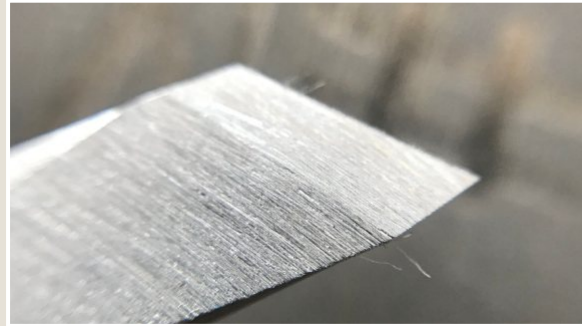
Always take care re-positioning the blade, that the angle is correct and the bevel is flat against the stone.



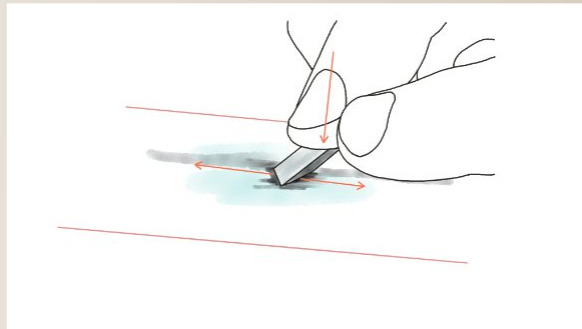


## Process

Pay attention to the shape of the tool, if you are correcting a faulty shape, put more pressure on the area you want to remove. If the tool is in good shape, take care not to change the shape with uneven pressure.

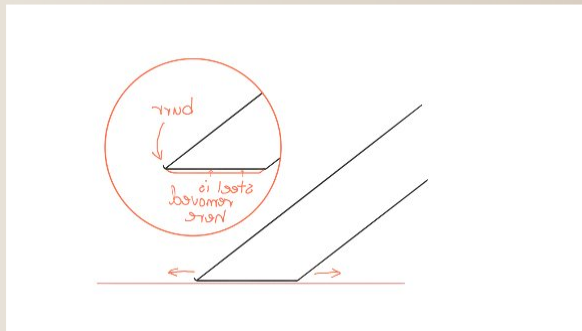


If an uneven angle is appearing from your work, put extra pressure on the opposing area of the bevel to make a flat surface. Work slowly and methodically, checking your progress often. This is the stage to make any corrections to the shape of the tool. Refer to the earlier chapter on tool geometry if you are unsure. The angles don't have to be exact to the degree, but too much variance will affect the tool's performance.



### A Burr Appears

As you grind the bevel a burr will start to appear at the tool cutting edge. This is a small sliver of metal hanging on, that bends upwards from the bevel at the back of the tool. You can feel this by stroking your finger down the flat side of the blade, towards the cutting edge.



Keep working until you have a small burr along the entire tool cutting edge. When this happens, it is the sign that you have done enough grinding to achieve a flat surface.



Don't worry about trying to remove the burr at this point, as you progress with finer stones, it will come away.

### Step 3 - Repeat on a Finer Stone

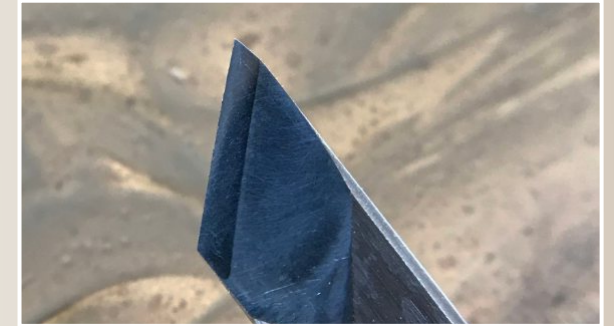
Change to the next finer stone and repeat the process on both the flat and bevel. This stone will make a more polished surface, keep going until all the scratches from the previous stone have been erased. Take care not to alter the shape of the tool now, we are only making each surface finer and finer, while concentrating on keeping them flat.



## Process

Follow the same procedure, first the flat side and then the bevel.

The burr will start to become very thin and may even break away, which is normal. You may see the small sliver of metal on the stone.



When both the flat side and the bevel are perfectly surfaced with this stone, move on to your finest stone and repeat the process. Again, take care to keep the surfaces perfectly flat and not to alter the shape of the tool.



Each surface should be more and more polished and shiny. If the burr is still attached, this stone may remove it naturally.

After finishing with your finest stone, you may start using the tool to carve, but first wipe the blade clean with a rag, then using a lightly oiled rag, wipe all remaining slurry and moisture from the blade, leaving a thin layer of oil. Camellia oil or a light machine oil is suitable.



### Polish if Preferred

Rub some wax polishing compound in a few firm strokes on the leather. Then, holding the tool firmly, place the bevel flat on the leather. Pull the tool backwards, so the bevel slides along the leather. At the end of the stroke, lift the tool and place the bevel down again at the start, and repeat the stroke. Only a few strokes are enough, too much and you will start to round the bevel.



Never do the flat side on the leather strop, as it will round over your cutting edge.

This sharpening procedure is the same for any flat tool. The kentou chisel, pictured at right, keeps a 90-degree angle between the cutting edge and the side of the tool. Being larger, it is also a little easier to do.





Tips for the Beginners

- 1. Resting one of your “spare” fingers on the stone can act like a guide to help keep the grinding angle correct.
- 2. Keep watching, stopping and inspecting as you progress, it’s easier to correct a mistake as it starts, than correct it later on when you have a larger mistake to correct.
- 3. The flat side takes longer, as the entire side is hard, and you have a much larger surface area.
- 4. Polishing on the leather strop in only done on the bevel, never the flat side of the tool.
- 5. Colouring the bevel with a marker pen will make it easy for the beginner to see what the stone is touching, as the coloured part is worn away by the stone.
- 6. The flat side of a knife tool or kentou chisel may have a shallow hollow, it’s not necessary to flatten the entire blade.

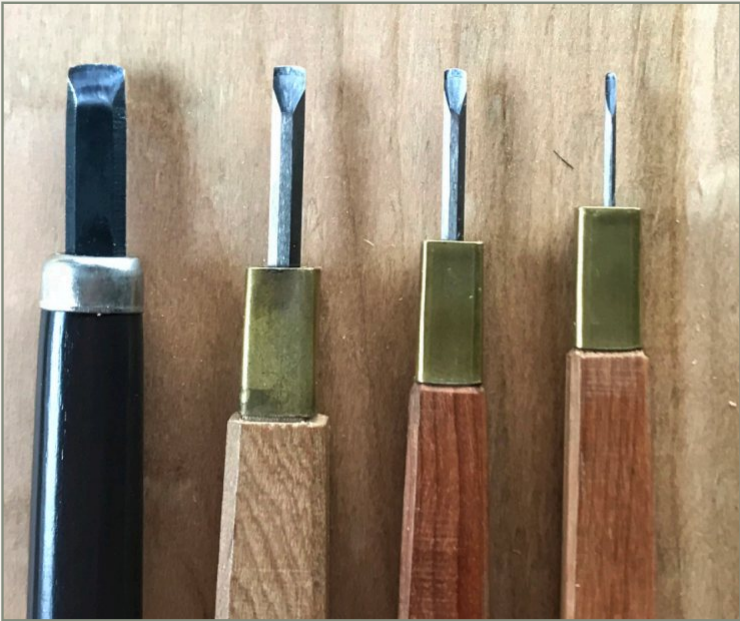
A sharp knife cuts details beautifully



The Aisuki or Clearing Chisel

Although the aisuki is in the flat chisel category, as the bevel is slightly curved, it has some similarity to sharpening a gouge, in that we need to maintain a curved cutting edge.

This means that as we grind or sharpen the bevel we need to also rotate the blade a little, so that the stone works evenly around the curved bevel. Take care not to rotate the tool too much, as this will quickly take the corners back and make the profile too rounded. Look at the photograph below to see the correct profile of the curved bevel. A larger aisuki is easier to see than a very small one, but the radius of the curved bevel is about the same for all sizes. This curved bevel allows the front edge of tool to shave high points without the corners digging in.



Several Michihamono aisuki (left to right)

7mm “Woody” student tool

4mm professional aisuki

3mm professional aisuki

1.5m professional aisuki

We can see the bevel has a slight curve, which about the same radius in all sizes.

Process

As the bevel moves against the stone it needs to be tilted slightly, as shown. As you stroke backwards and forwards, the tilt needs to rotate, so that all parts of the bevel receive an equal amount of grinding or honing.

Apart from this need to rotate the tool, the sharpening process is the same.

Here we can see the bevel is still flat against the stone, maintaining the correct angle, but the tool is rotated. A different part of the bevel is now against the stone.

Note – we can see that the flat side of this tool is hollow ground, which can vary between manufacturers.

