

Bonsai Tools – by Mark Wallerich

○ Bonsai Tool Metallurgy

What is not being used in bonsai tools – Most of the American Iron and Steel Institute (AISI) and American Society for Testing and Materials (ASTM) metals are not being used for Japanese or Chinese bonsai tools. The best steels (stainless or otherwise) comes from the US, England, Germany, Switzerland and Sweden (and Brazil where a bunch of German scientists immigrated to after WW2). Masakuni might be using the better steels but this is not confirmed (but the tools sure act like it). Kaneshin does use tool steel in some of their scissors which is a common good grade of steel. Most everything used for bonsai tools in Japan is a variation of either a martensitic stainless steel (heat treatable) or a basic high carbon steel based upon the traditional Japanese steels.

Stainless Steel – Almost all of the stainless steels used are heat treatable due to the presence of .4% to 1.2% carbon in the material (martensitic stainless steels). The higher the carbon content, the harder you can heat treat the steel. Hardness' can range from 52 HRC (Hardness Rockwell C scale) to 62 HRC or higher in the more expensive tools. Because these stainless steels have carbon in them, they are not completely stainless, but they do much better with adverse conditions than just high carbon steels. Stainless steel tools are better for use on trees that have acidic sap like *Portulacaria afra*, many succulents and Ficus trees. These stainless steels are magnetic and are usually more expensive.

Basic 18Cr8Ni stainless steels (18% Chrome, 8% Nickel) are non-magnetic and are work hardenable (austenitic stainless steels). These stainless' have almost no carbon in them so they cannot be heat treated but they are almost completely stainless in any condition. By working and stretch the material they can get harder (think of a stainless steel kitchen sink), but they cannot be hardened as much as martensitic stainless steels.

Carbon Steel - All of the carbon steels used are heat treatable due to the presence of .4% up to 1.45% carbon in the material. There are some layered scissors that use iron (<.1% carbon) for the body and blade backing, and use a layered high carbon steel for the cutting edge (similar to Japanese Katana's). Hardness' can range from 58 to 65 HRC. If you get much harder than this, the material becomes brittle and can break or crack.

Forging – Most bonsai tools are forge formed (scissors, and cutters) either by hand or machine. Stretching or pounding the steel like this makes the material grain structure long and thin to improve strength and durability similar to the way bamboo naturally grows.

Traditional Japanese Steels – They are traditionally yellow, white and blue Yasuki (city/area in Japan) steel based upon the color paper used to identify the types of steel. Yellow steel is generally a medium to high carbon steel with some minor impurities. White steel is a high carbon steel with the impurities removed. Blue steel (highest grade) is made from white steel, but has added chrome, tungsten and sometimes molybdenum or vanadium added for additional strength and durability. Over the recent decades, more versions of the Yasuki yellow, white and blue steels has been added.

○ Bonsai Tool Selection

Primary Tools – The main primary tools to have are Scissors, concave cutters, and garden pruning shears. There are three main types of scissors (butterfly, general trimming and bud scissors) and two main types of concave cutters (straight concave and spherical concave) not including size differences. There are dozens of different versions of scissors and concave cutters with different handles and blade configurations.

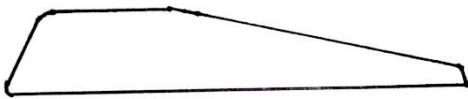
Secondary Tools – Depending upon the work being done, you will need additional tools such as knob cutter, spherical knob cutter, spherical concave cutter, wire cutters, root cutters, trunk splitters, wire pliers, Jin pliers, chop sticks, rooting hook, carving tools, saws, etc.

Root cutting Tools – It is advisable to have a different set of tools (cheap) for root pruning during repotting. Trimming roots and soil is extremely hard on tools, so you do not want to damage your good tools for repotting.

Note – Some bonsai tools are difficult if not impossible to replace. Scissors need to have a short blade length so they do not warp while cutting. Bonsai wire cutters are made to specifically cut the wire off the limbs without damaging the bark. But, not all of your tools has to be a bonsai tools. As long as it is of good quality and works, that is all it matters. Tools like electrical wire cutters, bent needle nose pliers, stout blade knives, hemostats, hobby carving tools, pruning shears, etc. can all be used very effectively.

Scissors Cut Profiles – Shear cut and knife cut

Shear Cut - Each blade has an angled cutting edge. This will cut well and is durable. Uses include cutting roots in repotting.

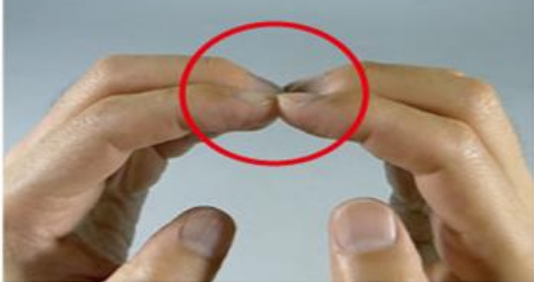


Knife Cut – Each blade has a knife cutting edge. This can be used for more precise and detailed work than the shear cut.



Cutter Profile for All Cutters, Except Scissors – The cutter edges should not touch as shown. They should overlap to prevent premature dulling of the edges.

The 2 edges touch like tweezers.



The right edge overlaps the left edge.



○ **Cleaning and Sharpening Bonsai Tools**

Cleaning Tools – Use alcohol, WD40 or various automotive petroleum base cleaners for general cleaning and disinfecting. If using WD40, make sure to clean off the WD40 before using the tool (not good for the tree). ALWAYS clean your tools between trees to prevent disease transfer. Clean and smooth tools also makes the cuts easier due to less friction.

You can use an abrasive eraser to clean off tree sap and corrosion from the cutting surfaces. An abrasive eraser is basically an abrasive rubber loaded with very fine sand. There are a few products available for doing this, like specific bonsai tool cleaning blocks, ones for mechanics tools, school block ink erasers, and even a pencil like stick ink eraser.

Lubricating And Preserving Tools – For lubricating the pivot joint, use a medium viscosity petroleum base oil (like a 20 weight. I use a petroleum base oil with Teflon powder). WD40 is too thin for lubricating a pivot joint, and secondly, it is not really a lubricant, but it can be used as a cleaner and a preservative for the tool. For preserving the tools it is recommended to use a plant based oil like Camellia oil. This is easier on the plants when using the tool without cleaning the preservative off first.

Sharpening Bonsai Tools – Items to use include sharpening sticks and wands (flat and round), sharpening stones, dremel tools, grinders, etc. If the steel is hard enough, steel files will not work, so only use ceramic, stone or diamond in 400 to 1200 grit sizes. Grit sizes smaller than 1200 (2000 – 5000 grit) are more for fine honing and polishing and are used mostly for the finest kitchen knives.

After many years of sharpening knives and various tools including bonsai tools, you start to recognize how hard or soft the steel is by how easy or hard it is to put an edge on the tool. Sharpening almost becomes an art form by itself, because each tool, knife, cutter, etc. is different and requires a different technique or sharpening stone or a different grit. It is actually normal for the same tool to require a different approach with each sharpening.

Sharpening bonsai tools is normally done only to a good working edge, not a razor edge (like Japanese kitchen knives). Cutting twigs and wood is rough on a blade and a razor edge dulls quickly and is fragile.

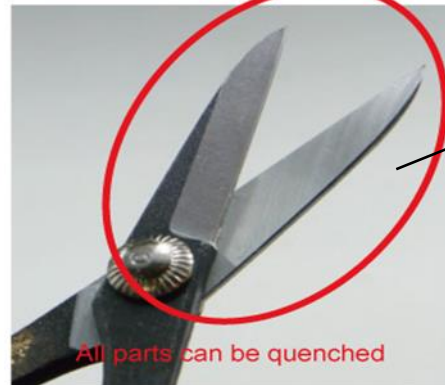
Edges to sharpen – For scissors and shears, only sharpen the OUTSIDE of the blades. Do not sharpen the inside of the blade. Only run a stone flat across the inside surface to take the sharpening burr off.

For cutters (concave cutters, knob cutters, root cutters, etc.), it is recommended to only sharpen the INSIDE of the blades, not the outside. On the outside, only run a stone flat across the surface to take the sharpening burr off. Depending upon what needs to be done, sharpening from the outside can also be done in some circumstances. If you are industrious, grinding and smoothing the inside of the blades makes cutting branches and wood easier due to less friction.

Sharpen the outside surface and edge only

Only lightly take the burr off the edge here. Do not sharpen the inside edge or surface.

(The combination)



Sharpen only the inside surface and edge on cutters.

Only lightly take the burr off the edge here. Do not sharpen the outside edge or surface.



○ Some Bonsai Tool Manufacturers

Sasuke (pronounced Sass-Kay) - Hirakawa Yasuhiro is a 22nd generation master blacksmith making scissors for bonsai (and other uses). Several of the scissors he makes are for bonsai. His great-great grandfather in Sakai, Japan started making scissors in the 1860's. Everything is handmade with layered Japanese steels. It can take a month or more to make a pair of scissors. The waiting list is more than a year. Used pairs go for \$1000 USD or more.

Masakuni – The original Japanese designer and manufacturer of specific bonsai tools for over 100 years. Masakuni is some of the best bonsai tools made with excellent fit, finish, and durability for both their carbon steel tools as well as their stainless steel tools. Masakuni became popular in US because Master John Naka used them. I do not think he promoted Masakuni, but people noticed and it spread. All I

heard John say was “USE GOOD TOOLS”. Masakuni has 4 levels of tools. The standard grade is common and affordable (sort of). The Professional, specially made, and made to order tools are much higher quality and much higher priced.

Kaneshin – The current owners’ grandfather started making the bonsai tools about 70 or more years ago. Their best scissors are layered Japanese white steel or blue steel. All tools have excellent fit, finish, and durability and are some of the better tools available. Primarily they use high carbon tool steel, Yasuki yellow, white and blue steel, and some stainless steel for making their variety of tools.

American Bonsai – Based in Florida, they started making bonsai tools in 2013. All tools have excellent fit, finish, and durability, and are some of the best tools made. They use several different compositions and grades of US stainless steels for their tools and are heat treated appropriately for the best durability. All their tools carry a lifetime warranty for the original owner. Use discount code PBS10 for 10% off.

Kikuwa – Kikuwa has been in business for over 60 years. They are similar to a coop, in that many Japanese craftsman, artisans, and manufacturers make their brand of tools, along with manufacturing tools for many other companies. Very well made tools with a nice fit, finish, and durability, notably with their handmade bonsai tools being the best. Several of their scissors have Aogami (blue steel) steel.

Joshua Roth – Excellently made tools since 1980. Their tools are only available through their dealers. I have owned and used Joshua Roth tools for over 30 years with excellent results. Some of their tool cutter profiles might be better for some bonsai artists. There are four grades of Joshua Roth brand of tools from novice to master all made in Japan. Joshua Roth also owns the China brand of tools RYUGA.

Wazakura – Wazakura has been making Japanese bonsai and Ikebana tools since 2019. Headed by long time master craftsman and designers. Very well made tools by local Japanese workshops. Many of their tools have different style ergonomic handles that other brands do not. Use discount code GROBONSAI for a 10% discount on the Wazakura website.

Tian-Bonsai (China) – The best bonsai tools that I have found out of China. They opened worldwide stores in 2013. All tools are heat treated stainless steel. They have 4 levels of tools. Master’s Grade and Master Craftsman Grade are only scissors. Each level is a different stainless steel with higher and higher levels of carbon and hardness. Their professional grade tools are heat treated to 55 HRC and are the best value for the price of any bonsai tools I have found.

Voulu (China) - Fairly well made Chinese tools. A good choice for the beginner bonsai artist. These tools are made by a company that makes hand tools and implements (hand-operated), cutlery, side arms, and razors. They have been making bonsai tools since 2016.

For **pruning shears** the best brands are **Felco** (Swiss), **Corona** (US), **Masakuni** (Japan) and **ARS** (Japan). Look for a wire cutting notch at the base of the blade for an added feature.

Conclusion – Where should I put my money in obtaining tools?

If you are just starting into bonsai and do not know if you are going to stay with it, go cheap with the basic tools. When you decide you will stay in bonsai, use your cheap tools for cutting roots and get better tools for the daily use. Like master Naka said “Use Good Tools”.

Buy the best tools you can afford that you will use the most, like a nice pair of Bud Shears, General Trimming Shears, Pruning Shears and either a Concave Cutter or a Spherical Concave Cutter. Be very discriminating with your selection.

With secondary tools like knob cutters, spherical knob cutters, trunk splitters, wire cutters, wire pliers, Jin pliers, chop sticks, rooting hook, carving tools, saws, etc., go cheap for anything you will not use very much.

For Root Cutters and Root Cutting Scissors, buy the cheapest that will work, because they eventually get destroyed anyways. Make sure you keep the root cutting tools separate. You do not want to be using your good tools by mistake.

Foot Notes -

- There are many other Japanese brands out there that I have no experience with, but they are probably pretty good as well. All of them are aware of Masakuni's reputation and are trying to be competitive with them.
- Many other china made tools would only be beginner tools. Many are carbon steel. It is not advisable to buy Chinese tools from EBay, Amazon, Etsy, etc., as the quality can be hit or miss.
- So far I have used Masakuni, Kaneshin, Joshua Roth, Fujiyama, Masaaki, Kiku, and Tian-Bonsai for many years with excellent results. Although I do not think Masaaki and Kiku are in business any more (Kiku may be Kikuwa now, but I do not know for sure).

References –

Masakuni, Kaneshin, Joshua Roth, American Bonsai, Tian-Bonsai, Kikuwa, Wazakura and Voulu websites.

Book - Introduction to Physical Metallurgy by Avner

Book - Metals Handbook, 8th edition

Book - Materials Selector Book by Materials Engineering

Book - Corrosion and Corrosion Control by Uhlig.

Some select Youtube video's and many years sharpening knives and tools.