

# Basic Ski Tuning

## Initial Ski Prep: What to do with a brand new ski:

### Bases:

- **Base Flatness:** Check bases for flatness with true bar in the tip, waist, and tail. If concave (base low) or convex (base high), the skis should be stone-ground flat. Generally, new skis are flat, but if not they need to be stone-ground.
- **Base structure:** skis should come with pattern in base material - this allows ski to glide without suction on snow. Most new skis come with sufficient structure.
- **Base edge bevel:** .5 to 1 degree. Most new skis come from the factory with a slightly inconsistent base bevel and average .75 degree. If flat (0 degrees), skis should be beveled by hand (.5 recommended)

### Side:

- **Side edge bevel:** 2-4 degrees from 90 (depending on the event and preference). Generally, J4 or younger use 2 degree, J3 or older use 3 degree - discuss this choice with coach. Check angle with file guide and true bar at several points along the ski to ensure the angle is true.
- **Sidewall removal/shaping:** Sidewall must be removed at an angle equal or greater than side edge bevel. Use sidewall remover or Panzer file with file guide. Material must be removed in order to maintain a consistent edge angle through the entire length of the ski - too much removed decreases the integrity of the ski, too little and edge angle decreases or file/stone will not cut properly. Material should have a smooth finish - sand paper helps.
- **Edge finishing:** Using a file-guide and spring clamp, edges should be finished with file, fine diamond stone, and then ceramic/Arkansas stone, finishing on the base side with a ceramic/Arkansas stone. Smooth and Sharp! Stones should be lubricated with water or polishing solution. ALWAYS finish any sharpening or polishing on the base edge side with a ceramic stone. Alternatively, use "fibertex" or "scotchguard" to polish.

### Waxing and Brushing

- **Clean-Brushing:** Use a steel or stiff brass brush to clean the base before you apply wax to open the structure to accept wax. Brush from tip-to-tail.
- **Hot-scraping:** process of removing wax while still warm. Used to further clean the skis before applying more wax. Use a warm (soft) hydro-carbon wax (Base Prep, all-temp, etc).
- **Waxing:** Apply wax with waxing iron. Heat ski evenly and thoroughly, being careful not to heat one area too much or more than another. Leave wax on ski as long as practically possible.
- **Scraping:** process used to remove wax from base of ski. With a sharp plastic scraper, remove wax in light, even, tip-to-tail passes until base is clean. Don't forget to remove wax from sidewall/side edge as well.

- **Brushing:** process to remove all wax on the base and from it's structure. The wax should be "in" the ski - the base material is porous and absorbs wax. Any wax left on the ski should be removed as it will cause drag and be slow. When brushing final layer, start with stiffer brushes (Brass/Bronze) and work towards softer brushes (Nylon/Horsehair).
- **Wax cycle for** a new ski: Start with warm waxes and work to colder (softer waxes to harder waxes). Wax as much as practically and financially possible.

## Basic Maintenance: What to do with skis on the average day:

### Bases:

- Continue to occasionally **check base bevel and flatness with true bar**. Have the skis stone-ground and re-beveled if needed. Generally, stone-grinding should be done once mid-season, twice if used often.
- **Minimize diamond stoning and eliminate any filing of base edge** - this can easily change base bevel and severely change performance. Diamond stone carefully only to remove "burrs" (imperfections caused by hitting rocks, etc).
- **Freezer-burn:** White "fuzz" on base material along the edges, particularly under binding. This is caused by skiing on hard, aggressive, cold snow without proper wax. This makes the ski slow. Minor cases can be fixed with applying hard wax, severe cases must be stone-ground.
- When waxing skis for cold or aggressive (new) snow, use the coldest (hardest) wax along the edge, especially under the binding. If using a bar wax drip a small amount of the hard wax along the edge before dripping the temperature appropriate wax on the entire ski. Iron both waxes together. If using a powder sprinkle the powder on the base next to the edge underfoot before dripping the temperature appropriate wax on the ski. Iron both together.

### Side

- Continue to occasionally **check side bevel with true bar and guide**. If not correct, adjust technique, remove more sidewall, or visit shop to have re-set.
- **Keep sidewall adequately removed and smooth** - majority of time is spent skiing on edge so sidewall should be smooth and consistent to eliminate drag, cut smoothly through snow, etc.
- **Burr removal** - before filing, remove any and all burrs with a coarse diamond stone.
- **File/Stone** as described in initial set-up process and finish on the base with a ceramic stone.

### Waxing and Brushing

- Always **clean-brush** before applying wax until base is clean - **Hot-scrape** when possible, especially after you've used any fluorocarbon waxes or additives.
- **Wax appropriate temperature range**. Add fluorocarbons when humidity is higher than ~35% (low fluoro) or ~60% (high fluoro). Consult wax companies book/website for condition-appropriate wax. Include a graphite wax once a week, if possible.

- **Scrape and Brush** as described in initial set-up process. **Keep bases smooth and shiny with lots of brushing** and Fibertex (Scotchguard). Any “hair” left from stonegrinding and regular wear and tear creates drag and reduces glide.

### **Practical hints:**

- **Don't rely on the clamp when sidefiling!** It is not strong enough to hold the file in place. Be sure to use your hand muscles to keep the file/stone and guide together to ensure a consistent angle. Keep the angle consistent and let the file do the work! If the file doesn't cut, either the sidewall needs to be pulled away or it's time for a new file!
- **Keep Scrapers Sharp!** Sharpen scrapers with drywall sanding sheets. They are cheap and effective. Alternatively, use a file. Be sure scrapers edges are flat - some consumer scraper sharpeners will gradually make a scraper concave and not scrape effectively.
- **Keep things clean!** Files/Stones should be cleaned to keep a good cutting edge - use file card or metal brush. Before waxing, be sure to clean the work area - sweep/vacuum filings/sidewall material, put away tuning tools, etc. Wipe the iron before applying wax. Use common sense!
- **Get a plastic tuning box** keep everything in - metal boxes may dull and ding the files, stones, etc... Use heavy duty rubber bands to hold the ski brakes in place on a daily basis. And don't forget to lock the box up if left out in the open!

### **Time Shortcuts and Money Savers:**

- **Focus on the Fundamentals!** Keep consistent edge angles, flat bases, and good scraping and brushing.
- **Don't stress as much about hitting the right wax** (or buying all the expensive wax!). Scraping and brushing well is far more effective!!!!
- Take the money you save on expensive wax and spend it on a **nice sidewall ripper and nice files/stones.**
- Brushing: **Brass Brushing** is the most efficient way to remove wax from the structure of the base. While it's nice to continue on to nylon and horsehair, brass brushing is more than sufficient for everyday training and most GS/SL races. If time is short, the Brass will do, but brush until no more wax comes off!

### **Tools for the job:**

[www.artechski.com](http://www.artechski.com) - ARTECH  
[www.swixsports.com](http://www.swixsports.com) – Swix  
[www.holmenkol.com](http://www.holmenkol.com) - Holmenkon  
<http://www.fktools-us.com/> SKS tools

You can pick this stuff up at most ski shops, but there are links following all of them if you'd like to buy online.

- **Vises:** a good 3-piece vise set is a must! Toko, Swix, Ski man all make them:  
<http://www.artechski.com/TokoWorldCupVise30mm.aspx>



- **Waxing Iron:** a few different models available - this one is good:  
<http://www.artechski.com/swixworldcupwaxiron73.aspx>



- **True Bar** - to check bevels and base flatness:  
<http://www.artechski.com/artechprecisiontruebar.aspx>



- **Base Bevel Guides:** Beast or SVST - .5 degrees:  
<http://www.artechski.com/beastbasebevelers.aspx> or

<http://www.artechski.com/svstfinalcutbasebevelers.aspx>



- **Side Bevel Guides:** Artech - select degree for finishing (2 or 3) and/or for pulling sidewall (4 or 5) (\*\*Small spring clamp can be purchased at local hardware store): <http://www.artechski.com/artechfileguides.aspx>



- **Sidewall Removal/Shaping:**
  1. SKS Tool - Perfect for removing all sidewall material - WORTH THE INVESTMENT in the long run! <http://www.fktools->

[us.com/ProductDetail.asp?PartNumNew=3035#](http://us.com/ProductDetail.asp?PartNumNew=3035#)



2. SVST WC Sidewall planer - another excellent tool, but pricey. Used best to remove the entire side of the ski to leave a smooth surface. Rounded bit. <http://www.artechski.com/svstwcsidewallplaner.aspx>

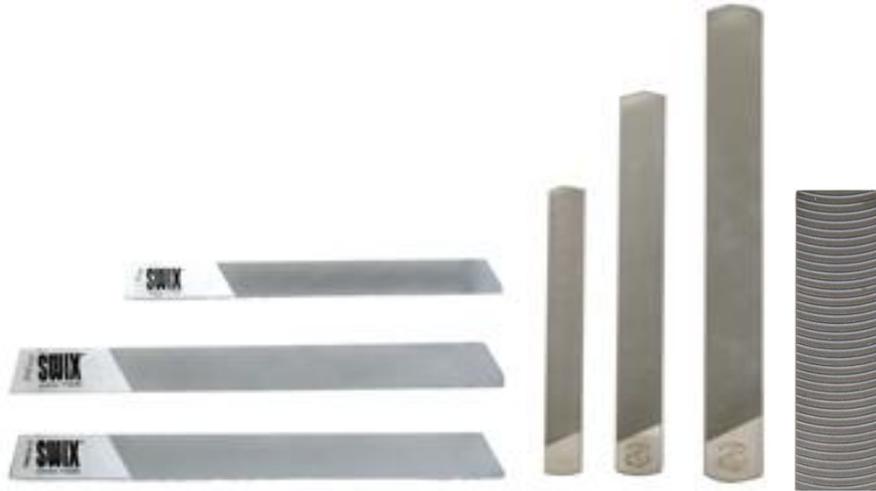


#### Less Expensive alternatives:

1. 4 or 5 Degree File Guide with Panzer - cheaper alternative, but effective.
2. Mountain Tek Sidewall planer - not as nice, but does a decent job. <http://www.artechski.com/mountainteksidewallplaner.aspx>



- **Files:** Many different makes and models, but generally, good to have a medium cut (8 inch) and a fine cut (6). It's easy to go through one of each per season. Also a Panzer file for shaping sidewall and heavy cutting: <http://www.artechski.com/swixracetechswisschromefile.aspx> and <http://www.artechski.com/sidewallremovalfiles.aspx>



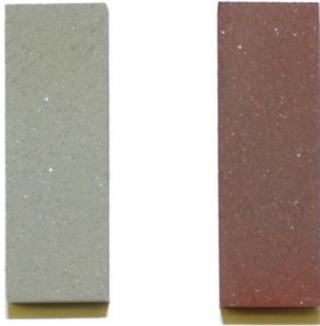
- **Diamond Stones** - Many different types - have a coarse for de-burring and a fine for finishing. Try the Diface Moonflex models, 200 (coarse) and 600 (fine).  
<http://www.artechski.com/diafacemoonflexdiamondfiles.aspx>



- Polishing - Arkansas Stone - doesn't actually cut the steel, only polishes and provides a longer-lasting edge - <http://www.artechski.com/arkansasstone.aspx>



- Gummi Stones - used for de-tuning, or dulling the edge when the snow is soft or grippy - <http://www.artechski.com/swixgummistone.aspx>



- Brushes - Oval Brushes work very nicely, although not mandatory. Many manufacturers and types. Brass is a must, others can follow: <http://www.artechski.com/artechovalbrassbrush.aspx>



- Scrapers - plastic - keep sharp! Thin ones tend to be better: <http://www.artechski.com/swixwaxscraperthin.aspx>



Wax - too complicated to go into here - depends on which system you like or choose. Stick to hydrocarbon wax for majority of the time (Swix CH or Base Prep, Holmenkol Alpha or Beta) - move to fluorinated waxes when it's warmer, wetter, and for GS or SG/DH races (Swix LF or HF, etc...). Pick a system and stick with it. Be sure to have cold wax in the ski when the snow crystals get aggressive - cold days or new cold snow. Consult with a coach about what to wax f