

# SKI TUNING AND WAXING

Tuning your skis is an individual process. Use these suggestions to create your own process. Once created though, you should follow the same process every time. Also keeping your process simple will allow you to produce a consistent result, which is extremely important – you need to know how your skis are going to react.

**Warning - if you are rushed – do not tune your skis.**

You will do a better job tuning and your tuning equipment will last longer if you keep your tools and area clean. For example, do not place your brushes bristle side down on a table full of edge filings. It doesn't take much effort to keep your area and tools clean and the rewards are substantial.

**“It is impossible to wax and brush your skis too much.”** – Justin Harvey, Sun Valley Ski Tools

**“A pair of boards that have been SOAKED IN WAX several times is going to be faster than a pair that hasn't. Skis won't win the SPEED EVENT because they were waxed with the right stuff the night before the race.”** – Pam Warman, Technician for the U.S. Alpine Ski Team

There are 4 external parts to a ski - the top sheet, sidewalls, edges, and base. To properly tune your skis, each of these parts should be addressed.

- Structuring your skis
  - Structure is a pattern of channels on the bases. There are various patterns depending on the type of ski and the snow conditions.
  - As the ski passes over the snow, friction causes the snow to melt and the ski is actually gliding on a very thin layer of water. The purpose of structure is to allow this water to escape from beneath the ski and also to prevent the forces of cohesion and suction from slowing you down. Wax repels water and also helps to remove the water from underneath the ski. Too much wax left on the ski though will clog the structure and make your skis slow.
  - Only a qualified shop should structure your skis.
- Set base bevel
  - Once the base bevel has been set – you should never use a file on it again. If you need a touch up – use a polishing stone. You'll only need to set the base bevel again after a base grind.
  - If unsure of your base bevel, start with a point five degree (.5). You can always increase your base bevel, but to decrease your bevel will require your bases to be stone ground.

- Some basic principles of a base bevel. A lower base bevel is used for skiing in more of an upright position – your edges are going to engage as soon as the skis are rolled over. A higher base bevel will allow your skis to travel farther away from your body before the edges engage.
- SL bevels – zero to point 5 (.5) degree
- GS bevels point 7(.7) to one degree
- SG and DH – one degree plus
- It is very helpful if your **name** and **bevel settings** are on your skis. For example, if you have .7-2 on your skis, this would mean a point seven bottom and a two degree side bevel. Sometimes the coaches may want to put a bit more of an edge on your skis, but this can only be done if the bevel settings are apparent. Also if your name is on your skis, this will eliminate the coaches guessing which skis are yours. Write this information on a piece of duct tape on the tips of your skis.
- Use a base bevel guide such as the Final Cut.
- Use a smooth pass with an 8" file.
- File from tip to tail.
- Clean base between passes with fiberlene paper or brush with a paintbrush.
- Clean file and bevel between passes with file brush.
- With the Final Cut, the file will stop cutting when the proper bevel has been achieved.
- Polish edges with whetstones and polishing stones placed in the file guide (wet the stone with a polishing solution, such as Secret Sauce or water).
  - Purpose is to smooth and harden the edge.
  - Clean edge with some fiberlene paper. You can wrap some fiberlene around a file.
  - Start with 220 grit whetstone, then move to a 320, and 400
  - Then final polish with a 220 polishing stone, then move to a 320 and 400.
  - Move to 600 for speed events
  - Polish from tip to tail
  - Make a few overlapping passes with each stone – finish with a few long passes from tip to tail.
  - Clean edge once again with fiberlene paper.
  - After you are done with each whetstone and polishing stone – be sure to clean it.
- After base bevel is set – be sure to clean ALL of the tools used.
- Setting the Side Bevel
  - A larger side bevel will produce an edge that is more acute (have a sharper point). The more acute the edge, the faster the edge wears out and the harder it is to keep the edge sharp. Also, with an edge that is more acute, the athlete must be more technically exact and

physically stronger to hold the edge. Otherwise the athlete will not be able to hold the edge and will skip across the snow.

- Tape the base with base tape to protect base from filings. Make sure the tape has no bubbles. Bubbles in the tape will catch the side bevel guide and the tape will peel off of the base.
- Use sidewall plane to expose the edge. Use some fine grit sandpaper to smooth the sidewalls.
- Clean the edge to make sure there is no residual wax, which will clog your file.
- If the edge is case hardened, use a double cut file, 120 grit diamond stone, or a coarse gummi stone to break down the case hardened edge.
- Use a side bevel guide such as the Pro Edge Beveler. Use a spring clamp to secure the file, whetstone, polishing stone, etc.
- If setting the side bevel for the first time – use a strawberry or panzer file to set the side bevel. This will remove a great deal of material, so be careful!
- Divide the ski into thirds - tip, waist and tail. Use a light pressure (let the file do the work) and use strokes, which will overlap each third. The final couple of passes should be long strokes from the tip to the tail.
- Between passes, make sure to brush away filings.
- Between passes, clean the file with file brush and also clean the bevel guide.
- Smooth the edge with a wetted 100 grit whetstone.
- Finish smoothing the edge with a few passes of a regular 8” file.
- Polish and harden the edge with whetstones and polishing stones as you did with the base bevel.
- If you are not sure how much material you have taken off – paint the edge with a marking pen. With experience you will learn how much material to take off and when your edge is sharp.
- **WARNING!! Unlike the base bevel guide, the side bevel guide will continue to cut the edge, even after the bevel has been achieved. Constantly check to see if you have reached the proper sharpness.**
- After the side edge bevel is set and polished, the edge is rolled towards the base creating a burr. Run a 220 polishing stone, soft gummi stone, or a 200 grit whetstone along the base to knock off this burr. Do this freehand with a very light touch.
- Wrap a file with fiberlene paper and wipe down the edge
- Clean the sidewalls with a fiber tex/3M pad as they are in the snow and can create drag.
- Place a light coat of high fluoro paste wax on the sidewalls. When racing the sidewalls may be in the snow during a turn – this light coat of wax helps reduce the friction.

- After using your skis, all you should have to do is touch up the side bevel of your skis. Use a 100 grit Moon Flex Diamond file, then polish as before. If the edge is damaged, you may have to use a file, etc.
- Detuning the skis
  - With skis being shorter, it may not be necessary to detune the skis
  - However, if you find either the tails or tips hooking, you can detune the skis with a few passes of a coarse gummi stone.
- Rounding the top sheet of the skis
  - Rounding the top sheet of the skis may help prevent the skis from catching on each other.
  - File the edge of the top sheet with a panzer file until the edge is rounded. Smooth with some sand paper.
- Hot Scraping – the purpose is to clean the skis and to impregnate the bases with wax
  - Wash your hands prior to waxing.
  - Brush skis from tip to tail with an aggressive brush - carbon steel or brass. You are cleaning the bases and also helping to expose the structure of the ski.
  - Note on brushes: you should mark the brushes so they are used in only one direction. If using a carbon steel brush, be sure to break in the brush on an older pair of skis. The purpose is to set the direction of the brush.
  - Wipe base with fiberlene paper.
  - Prior to waxing, make sure skis are not clamped tight into the vise – they should just be resting on the vise. Clamping the skis in the vise when waxing may cause severe damage to the skis.
  - Hot touch a soft wax onto the base such as Raceservice SBC 1
    - Make sure iron is clean – wipe with a clean cloth.
    - Touch the wax to an iron (iron should NEVER be smoking) – you want to use the lowest temperature setting that will melt the wax.
    - Touch softened wax to the ski – only a light-even coat is required.
    - Place a piece of fiberlene paper on the base and then place the iron on top of the paper. This will help prevent burning the base and help provide a smooth-thin coat of wax.
    - Drag the fiberlene paper and iron down the ski – there should be about a 12-18 inch trail of liquid wax. If the trail is longer – move the paper faster – if the trail is shorter – slow down the paper.
    - Please note the Raceservice SBC waxes have a special conditioner that allows the wax to stay liquid longer which results in greater impregnation

- If you are trying to replenish graphite into the base – use Raceservice SBCG 1. You will need to replenish graphite after a base grind or if you have been skiing hard snow such as man-made. An indication that you need to replenish the graphite will be when your bases have a slightly white sheen.
        - After hot scraping with SBC 1
        - Crayon on SBCG 1 (rub the wax directly on to the base)
        - Cork in SBCG 1
        - Brush with short bristle horse hair brush
        - Finish with long bristle horse hair brush
      - Scrape the ski from tip to tail with a plastic scraper – NEVER use a metal scraper. When hot scraping to clean your skis you do not have to wait for the wax to cool. Clean scraper repeatedly
      - Brush skis from tip to tail with an aggressive brush. Slightly wet the skis with a spray of water.
      - Remove the wax from the sidewalls and side edges with a kitchen scrubber (Chore Girl) or a plastic scraper.
      - Wipe skis with a fiberlene paper or paint brush
      - If this is a new pair of skis – this process must be repeated 7-10 times. If you are not using Raceservice SBC wax – you should repeat this process 20 times. **Note when conditioning new skis the wax should left to cool completely prior to scraping.**
      - If you are hot scraping to clean the bases, repeat the process until the wax from the hot scrape pulls clean.
      - Be sure to alternate skis – do not hot scrape the same ski twice in a row – allow it to cool a bit. For example, wax both skis, then scrape ski 1 and then wax again, then go to ski 2, scrape and wax – then go back and work on ski 1, etc. **Disregarding this rule may lead to severely and irreversibly damaging the camber of the ski.**
      - Now the skis are ready for waxing – either training or race – do not touch the bases with your hands.
- Training wax
  - Use a zero fluoro wax appropriate for the conditions – Raceservice ZF2 or ZF3.
  - Apply wax using hot touch method. Use fiberlene paper and iron in the same manner as when hot scraping
  - Allow skis to cool prior to scraping.
  - Clean iron.
  - Scrape with a plastic scraper.
  - Brush with an aggressive brush such as carbon steel or brass.
  - Brush again – if structure is for warmer snow – use brass horsehair, if cold snow structure use a short bristle horsehair
  - Lightly spray the base with water when brushing
  - Wipe with fiberlene paper – the paper will grab if there is still wax on the ski

- Use a long bristle horsehair brush to finish – about 100 strokes per ski
- Skis now are extremely shiny and ready to go – protect with a diaper
- Do not touch the bases with your hands!!!
  
- Race wax
  - Rub on appropriate Raceservice EGA wax (1 is higher fluoro for higher humidity to 4 to colder snow) – the coaches will let you know which one to use.
  - Cork the wax to spread evenly
  - Hot touch appropriate Raceservice CF wax (1 warmer snow to 4 colder snow) – the coaches will let you know which one to use.
  - Iron, scrape, brush skis the same as Training wax. Be sure to spray the skis lightly with water when brushing.
  - It is very important to scrape and brush skis before going to the race course.
  - When using fluoros it is EXTREMELY IMPORTANT to use in a well-ventilated area or use a respirator.
  - When using fluoros is extremely important that the iron does not smoke – if it is smoking you are burning the fluoros out of the wax
  - Be sure to clean the iron after each time you wax
  - At the top of the course – brush skis with long bristle horsehair brush. The cold temperature will help to squeeze a bit more of the wax out of the structure of the ski.
  - It is important to get the skis to the correct temperature – lay the skis on the snow – either on their sides or flat to the snow, depending upon conditions. Do not stand skis upright in the snow.
  - Race wax will be gone after about midway down the run – thus it is very important our skis have been impregnated with wax via hot scraping and conditioning.
  - For the second run. Rub on Raceservice EGA wax and cork and polish – first with short bristle horse hair and finish with long bristle horse hair
  - Overlays – application will be done by the coaches.
  - After the race – be sure to hot scrape to condition and to remove any remaining fluoros from the skis. A build up of fluoros will make the skis slower.
  - After using your skis for the day – be sure to dry your bases with a towel.
  - Store skis in a base protector (diaper).