



Ski Tuning & Waxing

Current as of September, 2020

This guide provides general information about basic ski tuning principles and techniques. Many different tuning and waxing ideas are out there and you will be exposed to many differing ways to accomplish the same end result as you develop your own procedure.

We feel that the best method for a full tune-up of your Alpine skis is as follows:

- Step 1 Set Up & Pre-Inspection
- Step 2 Edge sharpening, edge polishing, sidewall removal and detuning
- Step 3 Repair the base and sidewall
- Step 4 Clean the Base
- Step 5 Prepare for waxing
- Step 6 Waxing
- Step 7 Scrape
- Step 8 Brush and Polish

Detailed instructions on the 8 steps mentioned above and explanations of the specific tools and their uses are in the pages to come.











The information in this handout is to be used a guide for general tuning and waxing of your athletes skis. If you have questions, please ask your athletes coach or your local ski shop technician for the answers.













Recommended Tools

Pacesetter Ski & Snowboard offers a starter kit that includes all the basic tools and wax stored inside a metal tool box or the SWIX soft kit. Ask instore










for details on these kits.

GENERAL	
Tuning Table or Bench 	<ul style="list-style-type: none"> - A collapsible table that can easily be transported is your best option.
Ski Vice – 3pc 	<ul style="list-style-type: none"> - To hold your skis while tuning and waxing. Makes tuning and waxing easier.
Iron 	<ul style="list-style-type: none"> - Versions intended for ski waxing are the best option. They have thicker plates and hold heat better for applying wax. - Old style clothes irons are not the best, but will work fine. - Be sure it has a solid bottom (no holes!) and a temperature dial - Do not use Mom or Dad's good clothes iron...
Iron Cover 	<ul style="list-style-type: none"> - Use of an iron cover will protect the iron surface when stored in your kit.
Iron Holder 	<ul style="list-style-type: none"> - Keeps your iron from falling off your works surface. - Keeps your iron clean of filings etc. and will be ready for use when needed.
Brake Retainers 	<ul style="list-style-type: none"> - Rubber bands that hold your binding brakes out of the way while tuning and waxing (couple sets are good to have)
EDGE TUNING	
File Guides 	<p>Side edge file guides</p> <ul style="list-style-type: none"> - are used when filing or stoning the sidewall side of the edge. - used to accurately sharpen the side edge of ski (2 degree or 88 degree and 3 degree or 87 degree are most common) <p>Base edge file guides</p> <ul style="list-style-type: none"> - are used when filing or stoning the base edge. - used to accurately sharpen the base edge of ski (1 degree, 0.7 degree and 0.5 degree are most common)
Spring Clamp 	<ul style="list-style-type: none"> - Used to hold files and stones to side edge file guides.
Files 	<ul style="list-style-type: none"> - Coarse files work the best for initial material removal and setting of edge angles - Fine files work best for maintenance. - Chrome versions of files last much longer and are available at ski shops. - Regular steel ones found a home stores don't last as long but work fine when new
Diamond Stones 	<ul style="list-style-type: none"> - Available in different grits. Coarse (400 grit) and fine (600 grit) are recommended at minimum. - Used after filing to remove burrs left behind - Extra coarse stones (200 grit / 100grit) can be used as an alternative to a file if a regular routine is adopted where the removal of fine burrs and polishing is only required.

Continued - Recommended Tools

<p>Gummy Stone</p> 	<ul style="list-style-type: none"> -Used for dulling tip and tails -Used for removing rust from edges
<p>File Brush/Card</p> 	<ul style="list-style-type: none"> -Wire brush used to clean filings from your file.
<p>Paint Brush</p>	<ul style="list-style-type: none"> - Used between passes with files to remove filings and debris from the base. - Available at any home improvement store – get a large one.
<p>WAXING</p>	
<p>Wax – 2020 and newer</p> 	<p>Pro Pure Performance Speed (PS), Pro High Speed (HS) and Pro Top Speed (TS)</p> <ul style="list-style-type: none"> -Purchase PS wax for everyday and training use. -Purchase HS wax if want a better glide and for warm to cold race conditions HS waxes are also available is a liquid format. - TS wax should only be used for race days (and the occasional training session to gain some experience with the wax). TS waxes are also available is a liquid format. -Keep your wax clean and store in the packaging it came in or in a plastic bag away from dirty edge filings that always end up in the bottom of your toolbox! - Liquid versions should not be used as a replacement to traditional hot waxing. Liquid wax options provide the ability to top coat hot waxes and enhance the glide between runs. Apply in temperatures above 10 degrees Celsius, wait 15 minutes for the film to dry and polish with a soft nylon brush.
<p>Wax – older than 2020</p> 	<p>Hydrocarbon (basic), Low-Fluorocarbon (faster) and High-Fluorocarbon (fastest)</p> <ul style="list-style-type: none"> -Purchase hydrocarbon wax for everyday and training use. -Purchase low-fluorocarbon wax if want a better glide and for warm to cold race conditions (+2 to -12); you can always buy extreme cold weather wax if needed. -High-fluorocarbon wax is expensive and should only be used for race days (and the occasional training session to gain some experience with the wax). Everyday use of this stuff will dry your bases out. Fluorocarbon is an additive that increases glide. -Keep your wax clean and store in the packaging it came in or in a plastic bag away from dirty edge filings that always end up in the bottom of your toolbox!
<p>Moly Fluro wax (Optional)</p> 	<ul style="list-style-type: none"> -A fluorinated wax formula (MB77) for conditioning ski and snowboard bases. - Formulated for mid-range temperatures plus the addition of molybdenum for further resistance to snow abrasion. - Quality wax for reconditioning black bases
<p>Base Prep wax (Optional)</p> 	<p>BP77 - A harder Base prep for new DH, GS and SL skis used for all conditions. Can also be used for glacier training. The wax is good to work with and gives the skis a nice-looking finish.</p> <p>BP88 - The All-Round Base Prep wax for most skis/boards. Used on new skis and as travel wax.</p> <p>BP99 - Soft wax with low melting point. Recommended as the first wax on all new skis to make the base accustomed to hot irons</p>
<p>Base Cleaner</p> 	<ul style="list-style-type: none"> - Used to clean bases prior to waxing. - Use in moderation.
<p>Fiberlene</p> 	<ul style="list-style-type: none"> - Used with base cleaner to remove dirt and grime from bases prior to waxing. Fiberlene is LINT FREE so leaves nothing behind. - Can be used as the absolute final pass to polish the bases after brushing.
<p>Scrapers</p> 	<ul style="list-style-type: none"> -Standard plexi is all you need. 3mm and 5mm versions are available. 5mm version will give the best results. Keep them sharp to make wax removal simple. Never use a steel scraper to remove wax from your base. It may make the wax come off easier, but you will damage your base structure.
<p>Fibertex</p> 	<ul style="list-style-type: none"> - Available in different grits. - Fine grit - used for base polishing after use of a finishing brush. - Fine/Medium grit - used to polish the sidewalls of your skis - Coarse grit – used to expose base structure prior to waxing

Continued - Recommended Tools

<p>Brushes</p> 	<p>Steel Used to imprint structure into base, clean heavy ground in dirt and old graphite from the base prior to waxing.</p> <p>Coarse Bronze Used to texture bases prior to waxing and open structures of "Colder temp. Range waxes" after waxing.</p> <p>Medium Coarse Bronze Used to texture bases prior to waxing and open structures of "Colder temp. Range waxes" after waxing.</p> <p>All Round Nylon General purpose. -Starting out, all you really need is an all-round nylon brush; get the large (3"x5") rectangle one.</p> <p>Fine Nylon Used after waxing. Finishing</p> <p>Horsehair (or boar hair) Used after waxing. Finishing. Neutralizes static charge. Horsehair whisks away particles of warmer temp. range waxes and can be used for colder range waxes.</p>
STORAGE & TRANSPORT	
<p>Ski straps</p> 	<p>-Always use minimum of 2 straps on your SL and GS skis (tip and tails). SG and DH skis will require an additional ski strap mid ski.</p>
<p>Box or Kit</p> 	<p>-A tool box works to hold all your tuning gear, just make sure all your supplies fit in the tool box easily.</p> <p>- The SWIX soft wax kit (shown to the left) works well as a travel kit, but can be used as your full time/dedicated kit. (vices, iron, tools and wax can all fit into this kit with ease)</p> <p>-Put your name on all the tools and put a lock on the kit, you never know what strangers may want to borrow from your kit if you leave it unattended at a common wax room at a hotel somewhere.</p>
OPTIONAL	
<p>Sidewall Remover tool</p> 	<p>-For cutting side walls of skis and snowboards to expose more of steel edge for easier filing.</p> <p>- Removing the sidewall allows the file to sharpen the edges at your desired angle</p> <p>- If not removed, sidewalls will interfere with the file or stones ability to sharpen the edges.</p>
<p>Base Filler (P-TEX)</p> 	<p>-Used to repair gouges in the bases of your skis.</p> <p>- Available in Black and Clear</p> <p>-Keep in mind that small scratches aren't important to fill, and large ones that are rather deep may best be taken care of at a ski shop</p>
<p>Body File</p> 	<p>-Special tool with large teeth used to prep new skis (taking off sidewall to access the edge) and can also be used to remove excess repair material when repairing gouges in the base.</p> <p>-Double sided lengths can be purchased from ski shops</p>
<p>Steel Scraper</p> 	<p>-Used for base repair only - Never use a steel scraper to remove wax from your base. It may make the wax come off easier, but you will damage your base structure.</p>
<p>Plexi Scraper Sharpener</p> 	<p>-Used to sharpen dull plexi scrapers.</p>
<p>Glide Wax Cleaner</p> 	<p>-Improves glide and conditions the base.</p> <p>- Untreated Base = The wax stays on top.</p> <p>- Base treated with Glide Wax Cleaner = Better wax absorption!</p> <p>- Designed to purge the base of fluor waxes while leaving hydrocarbon wax behind.</p> <p>- Fluorocarbon wax can prevent the penetration of subsequent waxes.</p>

PRE-TUNING INSPECTION & SET UP

Start by setting up your ski clamps or vice on a work bench or table and using a brake retainer (rubber band) to collapse the ski binding brake out of the way by hooking one end of the elastic on one brake arm then stretch the elastic over the heel of the binding and hook the other end on the other brake arm.

Before you begin tuning your equipment, you should inspect the condition of the base and edges. Your end goal is to achieve a waxed flat base with clean, smooth, polished sharp edges. That means no rust or nicks on the edges or scratched, dry (white) and dirty bases.

The base should not be concave, or "railed", with the edges higher than the base.

A concave base or railed edges encourages the equipment to run straight and impairs the turning ability of the equipment.

Conversely, the bases should not be convex. A Convex base (base is higher than the edges) will cause your equipment to wander and make it difficult to put them on edge or grip on the snow.

To determine if your bases are either "Concave" or "Convex", run a straight edge or true bar at 90° down the base.

If you see light between the straight edge and the center area of the base, your bases are "Concave".

If you see light on the sides of the base, then your base is "Convex".



If either of the two cases exists, it is best to bring your equipment to Pacesetter Ski & Snowboard to have the base and edges leveled. Then continue on with the following steps in this guide.

EDGE SHARPENING

When you conduct a regular routine of tuning your equipment, filing edges is a simple and quick procedure.

This task can be done with nothing more than a metal file. However, it is recommended to use a bevel tool, because using a file on its own can ruin the edge of your ski if used improperly.

File Guide Types	Their Uses
Side Edge Guide	- Used to accurately sharpen the side edge of ski (2 degree or 88 degree and 3 degree or 87 degree are most common)
Base Edge Guide	- Used to accurately sharpen the base edge of ski (1 degree, 0.7 degree and 0.5 degree are most common)

When sharpening edges with bevel guide tool, depending on the style and make of your tool, remember that it may have different settings of degrees. If it is a variety that can change degrees make sure that it set to the desired angle before using the tool.

File Types	Their Uses
Chromed Coarse File	- Used to create edge angles or to remove excessive edge burr. (16tpcm or 13tpcm – teeth per cm)
Chromed Fine File	- Used to maintain the edge angle. (20tpcm – teeth per cm)

NOTE: The fine file should not be used if excessive edge burr is present. Use coarse file first.

Sharpen the side edge first, and then sharpen the base edge.

Using the side edge file guide, place a file in the bevel tool.

The file will only cut in one direction. Make sure you install so that the file will cut when you **“pull”** the guide and file along the edge of the ski.

Place your ski into the vices on their edge with the base directed away from your body – this will allow for easier and more accurate use of the files guide

Once the file is securely in the tool and your ski is firmly in place in the vices, place the guide on the base of one ski and run the tool along the edge.

“Pull” the tool towards you in short passes along the length of the ski. Keep your feet under your body where you are working to maintain consistency. Long reaches will not provide inconsistent and undesired results.

Repeat the motion until the desired sharpness is achieved. Turn ski over and sharpen the other side edge. Then repeat on the other ski.

2 to 3 passes should be all that is required.

Between passes, remove filings from:

- Your tool and file with a file card
- Your ski base with a soft paintbrush.

Once the side edges are sharpened, repeat the steps for the base edge using the base edge file guide, but place the ski flat (base directed towards the ceiling) in the vices.

**** You must always sharpen before you wax versus sharpening after waxing; otherwise you will scrape your wax off with the sharpening tools and your sharpening tools will become contaminated with wax.**

EDGE POLISHING

Once both side edges and base edges on both skis are filed to the desired sharpness there will be fine burrs left behind from the files. They must be removed by polishing the edges with diamond stones to give optimum glide.

Using the same file guides that were used for sharpening with files, place the "coarse" diamond stone and place the tool on the base of one ski and run the tool along the edge.

Polish the side edge first and then polish the base edge.

Repeat the motion with a "fine" diamond stone until the edge is polished smooth. Then repeat on the other ski.

Diamond stones can be used in both directions.

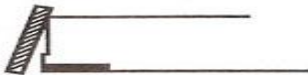
Diamond Stone Types	Grit	Their Uses
<i>Extra Coarse</i>	<i>100 or 200 grit</i>	<i>- Used to remove excessive burr.</i>
<i>Coarse</i>	<i>400 grit</i>	<i>- General / all purpose.</i>
<i>Fine</i>	<i>600 grit</i>	<i>- Finish polishing</i>
<i>Extra Fine</i>	<i>1000 grit</i>	<i>- Finish polishing</i>

**** With a regular routine of tuning in place, the sharpening edges with a file can be eliminated and the use of extra coarse diamond stone can do the job with less edge material being removed.**

SIDEWALL REMOVAL *(not required each time you tune – only perform this step if required)*

Typically, an acute side edge angle is what most racers need to better bite on ice.

When setting up or tuning skis with more acute angles, the sidewall often interferes with the process to efficiently produce the desired edge angle on the edge of the ski.



Proper side edge filing can only be performed when the sidewall is removed!

Somewhere along the path of your experience hand tuning your equipment you will feel like you are not removing metal edge when filing. Most cases you are removing plastic sidewall instead of metal edge. To properly sharpen the edges of your skis you will need to remove some sidewall (white or colored plastic material right beside the edge).

With a Side-Wall Removal Tool, remove some of the sidewall to expose more edge.

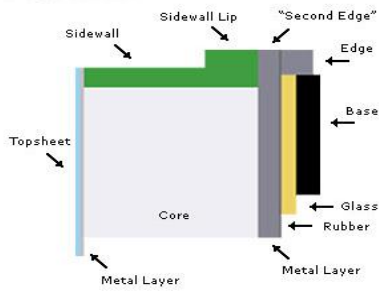
Take the time to shave the sidewall down in thin layers, avoiding digging into the sidewall and cutting away chunks as this will produce a rough surface that will add drag. Any form of drag translates into unnecessary friction. Sidewalls spend a lot of time in the snow, so they must be smooth and polished.

To smooth sidewalls use 220-grit sandpaper to sand the sidewalls after use of the sidewall removal tool and then polish with 400-grit sandpaper.

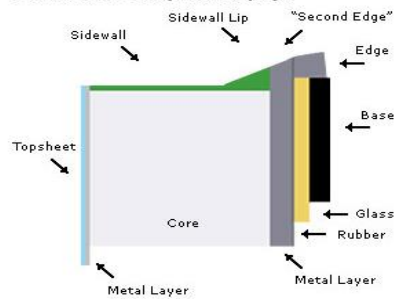
Cutter Types	Their Uses
Round cutter	Typically used for 'sandwich' construction skis. They are more universal than square cutters and work amazingly well on harder sidewalls found typically on competitive skis and particularly well for those new to removing their sidewalls.
Square cutter	Are typically used for 'cap' construction skis however work well on all types skis/boards especially for those who are more naturally skilled with their hands.

Sidewall cutting for laminate skis

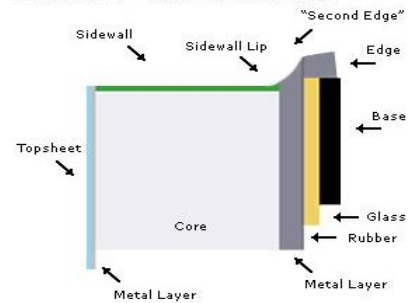
A GENERIC LAMINATE RACE SKI SIDE VIEW UNPREPPED



B GENERIC LAMINATE RACE SKI SIDE VIEW PREPPED - ANGLE APPROACH

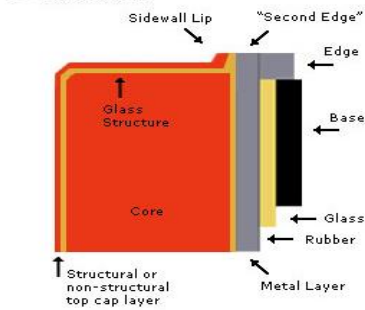


C GENERIC LAMINATE RACE SKI SIDE VIEW PREPPED - ROUNDED APPROACH

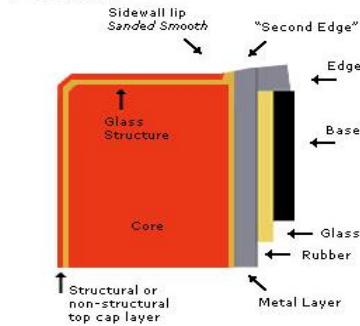


Sidewall cutting for cap skis

D GENERIC CAP RACE SKI SIDE VIEW UNPREPPED



E GENERIC CAP RACE SKI SIDE VIEW PREPPED



Important Considerations

- Do not cut down the sidewall to the metal edge. Sidewall material is needed to support the edge.
- Use utmost attention when cutting the sidewall on CAP skis. Do not remove too much material so that the cap releases and becomes delaminated from the rest of the ski.
- There are several sidewall tools with different blade shapes available. Keep in mind that the edge needs support material for strength and the rounded sidewall produces a thin support structure.
- If you are not 100% confident in the process, ask for advice before attempting.
- As you make your way to the tip and tail of the skis, you may have to taper the top sheet opposed to removal of sidewall. Use a coarse file to perform this.
- Remember that the sidewall is part of the ski & should be maintained like the rest of the ski with dings/cuts being trimmed smooth & polished to avoid the skis snagging on each other etc.



DE-TUNING TIP & TAIL EDGES

Should be completed after each time you sharpen edges.

Sharpen your edges all the way to tip and tail to ensure even wear, and then de-tune

Younger athletes will require de-tuning as they skid the skis still and a ski that is sharpened all the way to the tip and tail will not allow the skis to skid. As athletes get more skilled on hill, they may not require this step.

De-tuning the tip and tail reduces over turning and grabbing of the tip and tail.

Use a gummy stone to de-tune the edges at the tip and tail. To de-tune you hold the stone at a 45° angle to the edge and rub it back and forth two to three times length wise to remove the sharpness of the edge at the contact points of the tips and tails of your skis.

With the stone, pressing lightly (you can always remove more edge if not effective later) round the curved section of tip and tail approximately 3 to 5cm along the running surface (where the ski makes contact with the snow).

If you are unsure where those two points are, place your ski on a flat surface and mark the points where the edges rise up from the flat surface. Then detune from tip and tail to 3cm to 6cm past those points toward the center. You may have to experiment to find your preference, start with 3cm and you can always do more on the slopes with your stone.

BASE AND SIDEWALL REPAIR *(optional)*

Small scratches and scrapes in your base and/or sidewall and topsheet WILL NOT impede the gliding ability of the skis as much as you might think. If you attempt to repair these, the repair often affects the gliding ability as the repair will fail and fall out causing unnecessary drag therefore making the repair not necessary.

Gouges down to the core on your base or slivers on your sidewall and topsheet can act like rudders and should be repaired immediately. Use a file, or sandpaper to smooth out these surfaces.

If you are unsure of how to repair the scratches or gouges, bring your equipment to Pacesetter Ski & Snowboard to have them professionally repaired. A professional repair will provide the best end result.

PREPARING FOR WAXING

With your skis turned base side up. Set the iron to a low setting - it's important the iron doesn't burn your skis or the wax you are using. Set your iron to the melting temperature suggested on the wax package. Too low of a temperature and the wax won't melt and be absorbed properly, too high and it will burn and smoke and make you generally unhappy.

Clean skis of any filings that were left from sharpening with a soft paint brush. Use Fiberlene and **minimal** base cleaner to clean bases of finger prints, dirt and grime. Hot scraping your skis using an all-round wax also provides the desired result with no use of base cleaner. (Hot scrape = Apply wax and scrape off the wax while warm)

Wait 5 minutes till the bases of your skis are completely dry of base cleaner. Wax will not penetrate wet base cleaner.

Before applying wax to your base, use a coarse steel brush or hard nylon brush to clean out the structure of your base.

WAXING

This task is very important if you value going fast.

You cannot over wax. The more you wax your skis, the faster your skis will become.

Prior to waxing your skis, they should be at room temperature.

**DO NOT WAX IF YOUR SKIS ARE NOT AT ROOM TEMPERATURE!!! Damage will occur.
Loosen off the vices when waxing to allow the skis to expand with the heating of the bases.
Never place a hot iron onto bare bases.**

Ideally skis should be waxed before every trip or at minimum, every second or third time out.

The bases are made with a material that will dry out and affect the gliding ability if not regularly hot waxed. If your base dries out (base turns white along the edges - also known as base burn from friction when skis slide on coarse snow) it will not perform well and will tend to stick to the snow. Base burn seals up your bases and will not allow wax to penetrate in to the base no matter how much you try. If you have excessive base burn - bring your skis to Pacesetter Ski & Snowboard and have the base burn removed by tuning the skis by machine.

Rub-on waxes are available to purchase and might seem like a way to avoid hot waxing, but experience shows it is a waste of money as it is only a top coat and will not last long. The best method is to use iron-in wax. To perform this procedure, you will need specific wax for alpine skis and an iron kept for this purpose exclusively. It is important to have a dedicated iron for waxing because the wax will leak into the iron and will not be able to be used for other duties.

Choose the wax for your required temperature.

Most wax brands indicate AIR TEMPERATURE on the packaging of their waxes.

When the iron is warm (to the temperature recommended on the package of wax) and skis are at room temperature and dry, hold the iron vertically above the ski base, use your other hand to press the wax block against the heated surface of the iron. When the block of wax starts to melt, rub the block of wax onto the base of the ski like a crayon.

Repeat this motion until the full length of the ski is covered with wax.

Alternatively, you can hold the wax to the iron and let the wax start to drip from the iron. Moving steadily from tip to tail, make 2 quick passes down the length of your skis dripping beads of wax onto the base along the edge of the bases. Dripping wax along the edge provides a layer to where the iron will not touch bare base material when you begin to iron the wax into the base.

When the wax has been applied to the base, place the iron directly to the bottom of your skis and run the iron down the skis to melt the wax drip beads and/or the wax that was crayoned on.

Keep the iron moving, and working in ½ foot to 1-foot sections until the wax is uniformly spread the length of the ski and from edge to edge across the ski. Once you have made your way from the tip to the tail make a single pass down the entire length of the ski to smooth out the wax (AKA pooling) to make it easier for scraping.

Don't over do it!!! If you start to feel heat through the topsheet you will want to stop as you are getting to point where the temperature can damage your skis by bubbling the base material. This damage is expensive to repair and if not repaired will affect the performance of your equipment.

**Never place a hot iron on the base without wax!!!
Never leave the iron sitting in one spot on your ski!!!**

After ironing the wax into your bases, let your skis cool at room temperature (about 15 minutes) to ensure maximum wax penetration before scraping.

**** It is good practice to store your wax inside the containers you bought them in (or use plastic zipper bags) when inside your tuning kit to keep them from becoming contaminated.**

SCRAPING

Make sure you have a sharp plastic scraper with square edges.

Purchase a scraper sharpening tool to sharpen your scraper when it becomes dull.

Hold the scraper properly. Support the middle with your thumbs and wrap your fingers around the edges. Angle the top of the scraper toward the tip of the ski and, using slight downward pressure and a long smooth stroke, **push** the scraper down the length of the ski from tip to tail (direction the skis travel when on snow).

It is better to push the wax into the base than to pull the wax out of the base while scraping.

The goal is to peel off thin layers without gouging the base or altering its structure. Don't over scrape. Get off as much as you can and then rely on brushing to get the rest of it off.

Ensure that all excess wax has been removed from the sidewall, edges, tip and tail of the ski to ensure smooth running.

Use the short side of the scraper to remove wax from your edge/sidewall.

Never use the short side of the scraper on the base. Damage will occur to your base.

Never use the long side of the scraper to remove wax from your edge/sidewall. Damage will occur to the scraper that could further damage your base.

Note: If you're waxing with a cold, hard wax like Swix CH5/LF5 (or similar) and below, do yourself a favor and scrape it while it is slightly warm (not hot) from the iron, and then let your freshly scraped bases cool to room temp. If you let Cold waxes fully cool and harden, you'll feel like breaking out a hammer and chisel to get it off. Anything above Swix CH6/LF6 (or similar) let the waxed bases cool to room temperature before scraping.

THE WAX SHOULD BE "IN THE BASE" NOT "ON IT

BRUSHING

You cannot over brush. The more you brush (after scraping) the faster your skis will become.

Brushing should be performed in the direction the ski glides. Start at the tip and work towards the tail.

When using hand brushes, use a flicking motion when brushing to move the wax particles away from the base.

When using roto brushes ensure your drill is set to the correct direction to move the wax particles away from the base. (Reverse setting)

Begin brushing with a universal nylon brush. This removes the larger particles of wax from the ski and exposes the base structure (those tiny little channels that help break suction). Keep brushing until not much wax comes off the ski. Ensure that you are brushing from tip to tail (direction the skis travel when on snow). This will improve the gliding qualities of your skis.

Brass brushes can be used to clean the wax particles from skis that have been waxed with cold temperature waxes or if you have taken your skis to be restructured for spring conditions in which the structure is deeper and wider.

It is good practice to finish with a fine-bristled horsehair brush, a fine nylon brush or a fine steel brush that pulls the smaller dust-sized wax bits out of your base, but is not necessary if you only have a universal nylon brush.

If you only have a universal nylon brush you can also use a Fibertex pad to polish the base.

Be sure to not rub the Fibertex pad along the edges as it will dull your freshly sharpened edges. Using Fibertex with your hand will likely cause the Fibertex to contact the edges unknowingly. Place the Fibertex on your base and use your brush to grab onto the Fibertex opposed to using Fibertex with your hand.

Use a Fibertex pad to polish the sidewalls – use caution to not rub the Fibertex pad along the edges as it will dull your freshly sharpened edges.

A final pass with a role of Fiberlene will provide a polished fast base.

Do not tear off a piece of Fiberlene to do this step, hold the role and make passes up and down the skis with the role. If the outer layer of the Fiberlene becomes dirty, then remove enough to refresh the role.

TYPES OF BRUSHES

ABOUT BRUSHES:

In general, soft extruded bases and waxes require softer brushes and harder sintered bases and waxes require harder stiffer brushes. Wet snow conditions like those found in the spring require a harder brush also.

<u>Type</u>	<u>Use</u>
Steel:	To imprint structure into base, clean heavy ground in dirt and old graphite in base prior to waxing.
Brass Brushes:	To texture some extruded bases prior to waxing and open structures of "Colder temp. Range waxes" after waxing. Available in Coarse and medium coarse.
Universal / All-round: (Stiff Nylon)	General purpose. For texturing Fluoro waxes and cleaning bases of ground in dirt and old graphite and fluoro particles prior to waxing. Also used after waxing to open structure of base for colder temp. range waxes.
Horsehair (or Boarhair):	Used after waxing. Neutralizes static charge. Horsehair whisks away particles of warmer temp. range waxes and can be used for colder range waxes.
Fine Nylon Brushes:	Finishing

ROTO BRUSHES:

Versions of brushes are available that can be used with a drill and a shaft w/ handle to get the end result faster.

Horsehair, Fine Nylon, Hard Nylon, Steel Brushes are available in roto brush

**** Never place your brushes on your work surface with the bristles down.**

The bristles will become contaminated with edge filings etc and may result in damage to your base.

**** It is good practice to store your brushes inside bags (cloth or plastic zipper bags work good for this) when inside your tuning kit to keep them from becoming contaminated.**

CONCLUSION & TIPS

If your athlete is "training" on poorly tuned or neglected equipment and they only tune their equipment prior to competitions, athletes will not be preparing themselves for success. It is imperative that a regular schedule of equipment maintenance is adopted to ensure consistency between training and competition.

There are a couple of things you can do after each time out on the slopes that will greatly reduce the amount of time spent maintaining & repairing equipment.

First is to wipe the base and edges dry when the day is over and store the ski base up against a wall or on the floor bases up. Take a dry cloth and wipe off all excess snow and water to prevent rusting.

Do not store your skis in a ski bag. Moisture cannot escape from the bag and edges will rust.

Second, take the dry skis and quickly sharpen them with a diamond stone after or before each time out. This will take only 5 to 10 minutes if you do it each time

Use of skis straps (at contact points at the tip and tail) is a must to prevent damage to the bases and edges of the skis from rubbing against each other.

As many of you already know, wax rooms at hotels can be very small and crowded as everyone tries to do their skis at the same time. Any sharpening of edges, stoning, base repairs or major binding adjustments should all be looked after at home where you will have an abundance of tools, space and time. When travelling (races and training camps) only minor edge stoning and waxing should be all that needs to be done.

Use only Alpine Ski Specific wax only!!! Other types of wax (Cross Country waxes) will not produce the results that you want.

In general, a relatively warm wax (SWIX CH7/LF7, CH6/LF6 and CH5/LF5) is suitable. That being said, it is always better to wax using a colder wax if you are unsure.

Regular maintenance of equipment is a necessity.

Most cases just a few passes with your diamond stones and hot wax is all you need to do if you maintain a regular routine. Files do not always need to be used.

- A) At minimum, every week your skis should be waxed and the edges should be checked and sharpened, if needed.
- B) Skis should be waxed prior to each race and edges should be checked and sharpened, if needed.

Well maintained skis turn easier, hold better on ice, and make skiing less difficult and more enjoyable.

General maintenance should only take a few minutes, but if you neglect to be attentive with your tuning practices you will need to spend more time in the wax room to keep your equipment in good working order.

Make every day and every run count with well tuned equipment.

The information in this handout is to be used a guide for general tuning and waxing of your athlete's skis. If you have questions, please ask your athletes coach or our shop technician for the answers.

Ski Tuning & Waxing Procedures - Quick Reference

Step 1 Set Up & Pre-Inspection

Bring your skis inside and let them warm up to room temperature. Secure them to a vise with the bases facing up. Hold the ski brakes up using brake retainers.

Step 2 Edge sharpening, edge polishing, sidewall removal and detuning

Insert the file into the file guide and run the file along the ski edges from tip to tail. "Pull" the tool and file towards you. Make sure that you are using the appropriate bevel.

Sharpen side edge first then base edge. Between passes, remove filings with a soft paintbrush or clean cloth.

After filing, use the diamond stone in the same manner to remove any burrs.

De-tune edges at tip and tail to meet the needs of the individual racer.

Most cases just a few passes with your diamond stones and hot wax is all you need to do if you maintain a regular routine. Files do not always need to be used.

If required, remove some of the sidewall to expose more edge with a sidewall removal tool.

Step 3 Repair the base and sidewall

Small scratches and scrapes in your base and/or sidewall and topsheet WILL NOT impede the gliding ability of the skis; therefore, repair is often not necessary.

Gouges down to the core on your base or slivers on your sidewall and topsheet can act like rudders and should be repaired immediately. Use a file, or sandpaper to smooth out these surfaces.

Step 4 Clean the Base

Apply a small amount of base cleaner to Fiberlene and wipe the bases with to remove dirt and water. Inspect for scratches as you clean. Scrape off excess wax using the ski scraper.

Step 5 Apply Wax

Set your iron to the melting temperature suggested on the wax package.

Apply the wax by placing the block against a heated iron and crayon the wax onto the base or let wax drip onto the ski until there are many little drops of wax on the bases. Be generous with the wax application, but do not waste the wax.

Loosen off the vices to allow the skis to expand with the heating of the bases.

Step 6 Iron Wax in to the Base

Keep the iron moving, and working in 1 to 2 foot sections until the wax is uniformly spread across the ski. The wax should puddle on the base, and should not smoke.

Once you have made your way from the tip to the tail in 2 to 3 foot sections make a couple passes down the entire length of the ski to smooth out the wax (AKA pooling) to make it easier for scraping. Never spread wax in circles. Only tip to tail of vice versa.

Don't over do it!!! If you start to feel heat through the topsheet you will want to stop as you are getting to point where the temperature can damage your skis by bubbling the base material. This damage is expensive to repair and if not repaired will reduce the gliding ability of your equipment.

Never place a hot iron on the base without wax!!!

Never leave the iron sitting in one spot on your ski!!!

Step 7 Scrape off the wax

Allow the ski to cool (recommended minimum 15 minutes) then use a sharp plexi-scraper to remove any excess wax from the side edge and sidewall first then level the base surface. Scrape the base until very little wax comes off the skis.

Step 8 Brush and Polish

Brush the bases from tip to tail. (Direction of travel)

Use a Fibertex pad to polish the base after brushing - use caution to not rub the Fibertex pad along the edges as it will dull your freshly sharpened edges.

Use a Fibertex pad to polish the sidewalls - use caution to not rub the Fibertex pad along the edges as it will dull your freshly sharpened edges.

Use ski straps to prevent damage to bases with transporting.

***The information in this handout is to be used a guide for general tuning and waxing of your athlete's skis.
If you have questions, please ask your athletes coach or our shop technician for the answers.***

FREQUENTLY ASKED QUESTIONS

1.

CAN I NOT JUST BRING MY EQUIPMENT TO Pacesetter Ski & Snowboard OR OTHER SKI SHOP'S THAT OFFER SERVICING TO PERFORM TUNING AND WAXING FOR ME?

Long term, it is more cost effective for you to perform tuning and waxing on your own.

Always bringing your equipment to a ski shop for tuning and waxing will:

- Shorten the life of your skis
 - o Machine tuning will remove a minimal amount of material each time a ski passes over the machine. If you only service your skis on a machine, they will have a shorter life than if you tune on your own.
- Affect the long-term gliding ability of your skis
 - o The more you wax your skis the faster they will glide. Tuning your equipment on a machine on a regular basis opposed to waxing on your own will remove those valuable layers of wax that you want to have.
- You might think that tuning your equipment at a service shop will save you time, but it will actually cost you valuable time dropping off and picking up your equipment up from the shop.
 - o If you maintain a consistent routine of tuning and waxing on your own the process will only take 15 to 20 minutes out of your day each time you tune and/or wax.

The process is quite simple and once you develop a routine, you will appreciate the benefit to tuning and waxing your own equipment.

- Unlike a machine tune, when you tune your own equipment you do not always need to remove material from your skis to maintain the condition of your skis.
 - o When the owner performs their own regular routine of maintenance, only slight burrs caused from regular use will need to be removed and polishing the edges to maintain their sharpness will be required. No need to grind the bases when you tune your own equipment = longer life.
- You can add multiple layers of wax to increase the gliding ability of your skis.
 - o The more you wax your skis the faster they will glide.
- You know how you like your equipment tuned – a shop does not always know what you like and don't like.
- Proficiency and confidence on the slopes will happen faster if the owner performs their own regular routine of maintenance.
 - o If you are always using maintained equipment you will always know what to expect from your equipment in all conditions and that will allow you to gain confidence on the hill each time you are skiing. More enjoyment and more success.

The only time you should really need to have your skis tuned on a machine is to correct any issues that you cannot do by hand.

- Concave bases
- Convex bases
- Loss of base structure
- Base burn – caused from lack of waxing
- Base repairs – gouges in the base material

FREQUENTLY ASKED QUESTIONS - CONTINUED

2.

WHAT EDGE ANGLES SHOULD I USE?

Depending on ability, young racers should use a bevel of 2 degrees to 3 degrees on the side, and 0.5 degrees to 1 degree on the base.

Our recommendation for Nancy Greene (U10) athletes is to use 2 degrees on the side edge and 1 degree on the base edge.

Older Nancy Greene (U12) athletes can use 3 degrees on the side edge and 0.5 degree on the base edge. (Check with your child's coach to confirm your child has the ability to switch to this set up before changing)

We recommend that kinder (U14 and older) athletes use 3 degrees on the side edge and 0.5 degree on the base edge for SL and GS skis.

Check with your child's coach for appropriate edge angles for SG and DH skis as needed. (Typical is 2 degrees on the side edge and 1 degree on the base edge)

3.

WHAT EDGE ANGLES COME ON MY NEW SKIS?

The best answer to that question is: "it does not matter"

You should be setting up the skis with the edge angles that best suit your child's ability and development, not depending on what the manufacturer set the angles at from the factory.

4.

WHAT WAX SHOULD I USE?

WAX IS EITHER "ALL-TEMPERATURE" OR "TEMPERATURE SPECIFIC."

All-Temperature Wax – All-temp or universal wax is designed to work well in any temperature or snow conditions. It may be a good choice if the temperature varies a lot where you ride or if you ski in different geographical areas during your season and can't predict what the weather will be like.

Temperature Specific Waxes – Temperature specific waxes are designed to work best within a certain range of temperatures, providing increased performance that requires a little more effort. Swix "8 Series" (pink) waxes, for instance, are meant for temperatures between 1°C and -4°C (34°F to 25°F). There is some overlap in the temperature ranges; the next colder wax, the "7 Series" (violet), is for temperatures from -2°C to -8°C (28°F to 18°F). Temperature specific waxes will still work better than no wax in temperatures outside of their "ideal" range, and it's possible to combine two temperature specific waxes if you anticipate borderline temperatures. Using temperature specific waxes requires that you follow the weather and anticipate the temperatures you'll be riding in, and you might find yourself re-waxing if conditions change drastically.

Fluorocarbons – Alpine waxes are available in Hydrocarbon (basic), Low-Fluorocarbon (faster), and High-Fluorocarbon (fastest) versions. The increase in glide from adding fluorocarbons to wax can be dramatic, especially in high water content snow, but the price increases are pretty significant, too – users of high-fluoro waxes tend to be competition-oriented and willing to pay to gain a slight advantage in speed. For most recreational use, hydrocarbon or low-fluoro waxes are a good choice.

Airborne fluorocarbon fumes and particles have been associated with certain health risks, and PFC's (perfluorochemicals, the type of compounds associated with ski waxes) have been shown to accumulate in your body over time. If you use these waxes, it's recommended that you do so in an area with good ventilation and consider the use of a mask or respirator if you work with them a lot.