

Ski Tuning Basics

Key Message

- It's hard to achieve results on the hill if you don't look after your equipment.
- Practice, Practice, Practice – There's more than one way to do it
- Teach, Guide and Supervise your athletes – It's a process.
- Regular Maintenance is Key – Develop good habits
- KISS System – Keep it simple

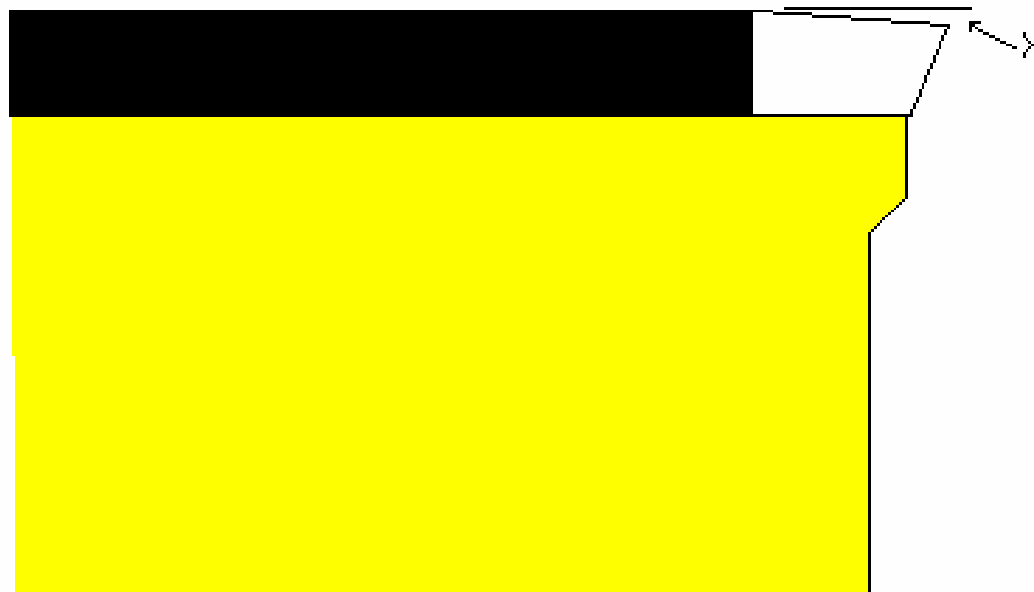
What Factors Impact Ski Performance?

- Base Bevel
- Side Edge Bevel
- Burrs

Base Bevel

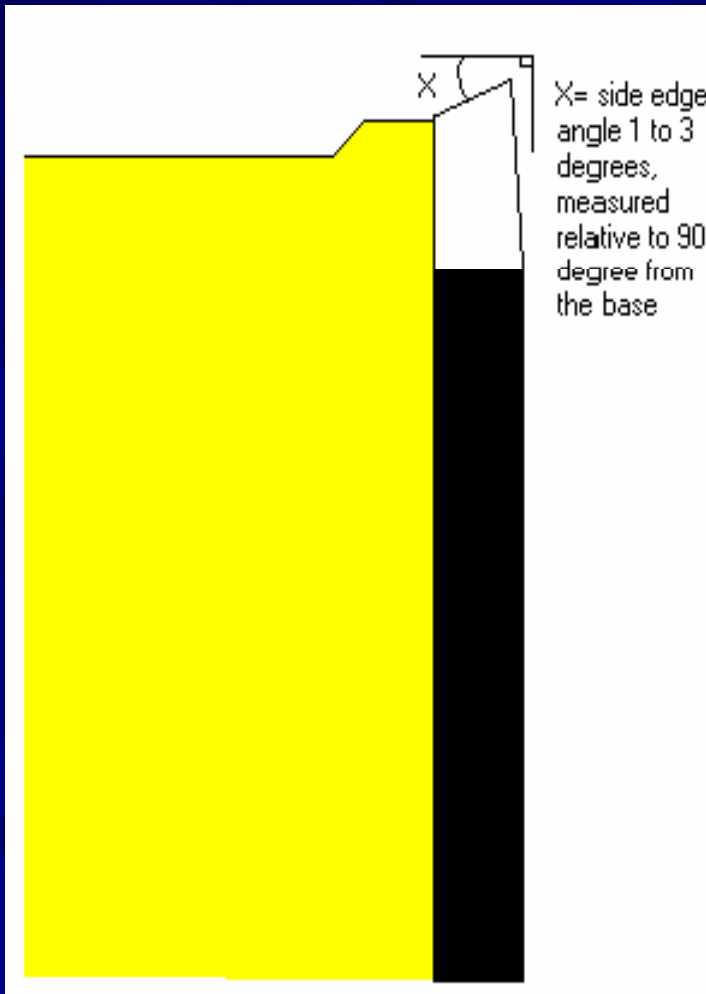
- Base bevel is the amount that the edge is tipped up off the snow relative to a flat base.
- Base bevels range from 0 degrees to 1.5 degrees.
- Less base bevel makes a ski engage quickly and grip hard.
- More bevel on the base lets the ski transition from edge to edge more easily, making the ski more forgiving, especially at speed.

X = base bevel .5 to 1.5 degrees
relative to base.



Side Edge Bevels

- Side edge bevel refers to how much the edge is “pointed” and is measured relative to 90 degrees of the base.
- Side bevel determines how the edge will hold, mild bevels of 0-1 degree provide some bite, but remain forgiving for less advanced skiers.
- For someone seeking a higher level of performance, side bevels of 2-3 degrees will allow the ski to hold better, especially on hard snow.
- Extreme side bevel of 4+ degrees hold even better, but can become too demanding for most people.
- Because of the increase in hold, the ski will be harder to break loose once it has been set on edge making a line correction very difficult.



What's Appropriate?

- Most important factor is to match the bevels to the skier's ability.
- A 90 degree edge angle will perform well and keep its edge longer than edges sharpened to less than 90 degrees.
- For Example, a 1 degree base edge bevel and a 1 degree side edge bevel result in a total edge angle of 90 degrees.
- By tilting the 90 degree angle with bevels you create a high performance yet long lasting edge angle.

HERE ARE SOME GENERAL GUIDELINES USED ON THE WORLD CUP

Base Bevels

SL base edge = no bevel

GS base edge = 0.5 to 1 degrees

SG base edge = 0.5 to 1 degrees

DH base edge = 0.5 to 1 degrees

Side Edge Bevels

SL side-edge = 3 to 5 degrees

GS side-edge = 3 to 5 degrees

SG side-edge = 3 degrees

DH side-edge = 3 degrees

Setting Edge Bevels

- The first step in edge tuning actually starts with the base.
- Using a true bar start at the tip and check the base for flatness.
- Base bevel can only be increased, so if the ski has more bevel than you desire it must be stone ground to take down the base.
- Stone grinding is the only way to create a perfectly flat base.

Setting Edge Bevels



- Start on the edge that is away from you.
- Which end of the ski you start from will depend on whether you are left or right handed, and if you prefer to push or pull the file.
- Working the edges either from tip to tail or tail to tip is fine so long as technique is kept consistent.
- Start with light strokes of 10 to 20 cm moving down the length of the ski.
- Then clean the base and tools from filings and check your work.

Setting Edge Bevels

- Continue with progressively longer strokes, still with light pressure, checking the bevel and cleaning the base often.
- To bevel the other edge switch the ski so the opposite edge is on the far side, and repeat the process.
- Once the bevel is set, use a diamond stone for maintenance.
- Sharpening the ski is done on the side edge.

Side Edge Bevels

- The first step is to remove some sidewall using a sidewall remover tool



- To avoid the 'Chatter' don't set the cutting dept too deep.
- Don't remove too much as the sidewall supports the edge.

Side Edge Bevels

- Start using short, light strokes to set the bevel. Continue with longer, light strokes as it leaves a smoother finish. Keep the pressure light



- Clean the tools, and ski base frequently. Metal edge filings can scratch the base if dragged along by the side edge guide.
- Only remove enough material to set the bevel and sharpen the edge, removing more only shortens the life of the ski.
- Be sure to remove an equal amount of material over the whole length of the ski.

Deburring and Polishing Edges

- The freshly filed edge will have a burr hanging off the side edge.
- You can feel this burr catch your finger nail, at the point of the edge.
- The burred edge must be cleaned up. A clean edge will ski easier, and stay sharper longer.
- Start with the ski still mounted on its side with the base facing away; hold the diamond stone flat against the base then tip it up very lightly to match the base bevel.

Deburring and Polishing Edges

- Run the diamond stone along the edge back and forth the entire length of the ski.
- Two or three passes should be enough.



Deburring and Polishing Edges

- Then using your side edge guide and the diamond stone, you should hone the side edge.



- This process should be repeated until the burr is gone.
- By using this process with finer and finer diamond and ceramic stones, the edge will become sharper and free of burrs.
- The finished edge should feel glassy smooth as you run your finger along the edge, but razor sharp when you drag your hand across it.

De-Tuning Tip and Tail



- Gummi stones can be used to de-tune the tips and tails.

Hardened Edges

- Hitting rocks or even skidding on hard snow can cause the metal of the edges to harden.
- This hardening can create spots on the edge that have hardness greater than that of a file.
- A file will only skip off these spots, and become dulled.
- An extra coarse diamond stone must be used to break through this hardened spot.
- Once the hardened spot is removed with the diamond stone the edge can be filed as usual

Cleaning the Base

- The best method for cleaning the base is hot scraping using a soft warm wax.
- By carefully scraping the ski with a plexi scraper before the wax fully cools, the wax will be pulled out of the base and with it pull out dirt that was in the base.
- Brushing with a copper brush will clean the base further

Waxing

- Rub some wax on the base prior to dripping the wax with the iron. This will protect the base from burning.
- Be sure to use enough wax. If you do not have enough wax to protect the base from the hot iron, you will burn the base.
- Take your time. The ski needs to be warm. Check the temperature of the top sheet (underside). It should feel warm.
- Rough guide is about 10 minutes per ski.

Scraping and Brushing

- Let skis cool for at least 1 hour before scraping and brushing. The longer the skis are left the better.
- Use a sharp scraper and light pressure vs. a dull scraper and heavy pressure.
- After scraping, start brushing with a white nylon brush.
- Use a horsehair brush to finish.
- The goal when brushing is to remove the wax that is on the surface of the ski without disrupting the wax in the base.

Tuning Kit

- Base Bevel Guide
- Side File Guide
- 8" File
- 4" File - Aggressive
- Course Diamond Stone (200 grit)
- Fine Diamond Stone (400 grit)
- Gummi Stone
- File Card - Cleaning
- Sidewall Remover
- Iron
- Vices
- Brass, Nylon, Horsehair Bushes
- Plastic scrapers
- Drywall Sandpaper
- Wax
- Paint Brush - Cleaning

Conclusion

- It's hard to achieve results on the hill if you don't look after your equipment.
- Practice, Practice, Practice – There's more than one way to do it
- Teach, Guide and Supervise your athletes – It's a process
- Regular Maintenance is Key
- KISS System – Keep it simple