

## Basic Race Ski Tuning

This information is aimed at keeping skis “tuned” and is most appropriate for interclub and practices. Race tuning can be very involved, using a lot of equipment and variety of base (wax) treatments. The greater the efforts provide more marginal benefits which means important when a tenth or few hundreds of a second matter. **Basic tuning versus untuned skis is the difference between making effective turns and struggling on the hill at practice. This is a necessity and not a marginal competitive benefit.**

We will provide a process on how build your knowledge and equipment infrastructure over time.

### Ski Tuning – 4 Actions

1. Side Edge sharpening
2. Base Waxing
3. Base Edge sharpening
4. Base Structure - Grind

**New Skis** are best set up with a race tune at the ski shop. This will set up ski edges which can be maintained for several weeks of use.

**Used Skis** are best taken to a shop to get a “race tune” and a base grind which will be discussed below.

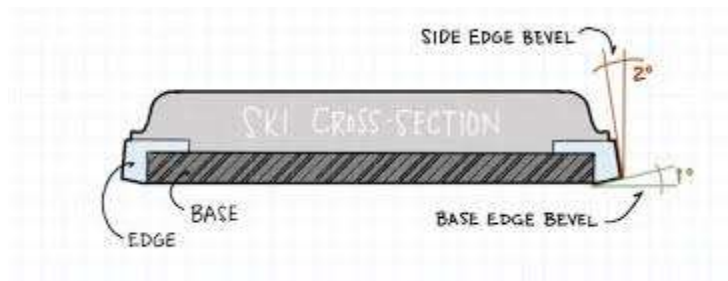
What is a “race tune?” You should ask a shop what they do for a race tune. Shops often tune skis such as rentals using a high-volume process on basic machinery. A race tune is more individualized, focused and sets the correct base and edge bevel. It can involve a full automated machine tune on a high-end machine, but is often done by hand. Wintersteiger makes a range of ski shop tuning equipment with the highest end Jupiter machine costing about \$500,000. The next model down is \$300K. These machines are amazing to watch.



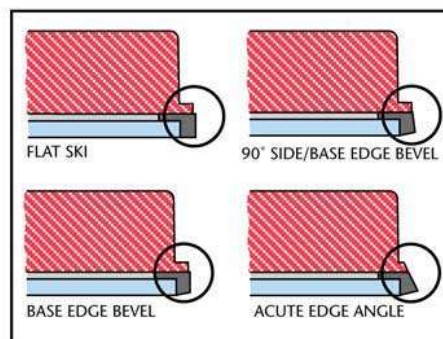
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**Side Edge Sharpening:** This is the most important element as it allows the ski to grip the snow through a turn, especially in icy conditions. This involves a machine or file tune to set a sharp edge which is maintained with diamond stones. Maintenance should happen daily. This keeps a sharp edge longer with less filing. The diagram below shows the difference between side and base edge. <sup>1</sup>



**What is a “Bevel”** A bevel related to changing the edge from 90 degrees in order to improve control. This is done on the side edge and base edge. Refer to the diagram below.<sup>2</sup>



Racers typically have a side edge bevel of 3 degrees and a base edge bevel of 0.5 to 1 degrees. **When a shop sets up the skis you need to know the bevel in order to maintain**

<sup>1</sup> Image skimag.com

<sup>2</sup> Image raceplace.com

**them. Machine tunes may not set a bevel and that is important to know, as it would require extra filing.**

**Base Waxing:** This is the second most important maintenance and should also be occurring daily. Bases are designed to hold wax in their porous structure and failure to maintain the wax is bad for the ski and leads to a whitish base also known as base burn. Wax is designed to act like a lubricant. Waxes can be perfected based on temperature and new and old snow. This is basically the difference between the hardness of the snow crystal and the moisture content.

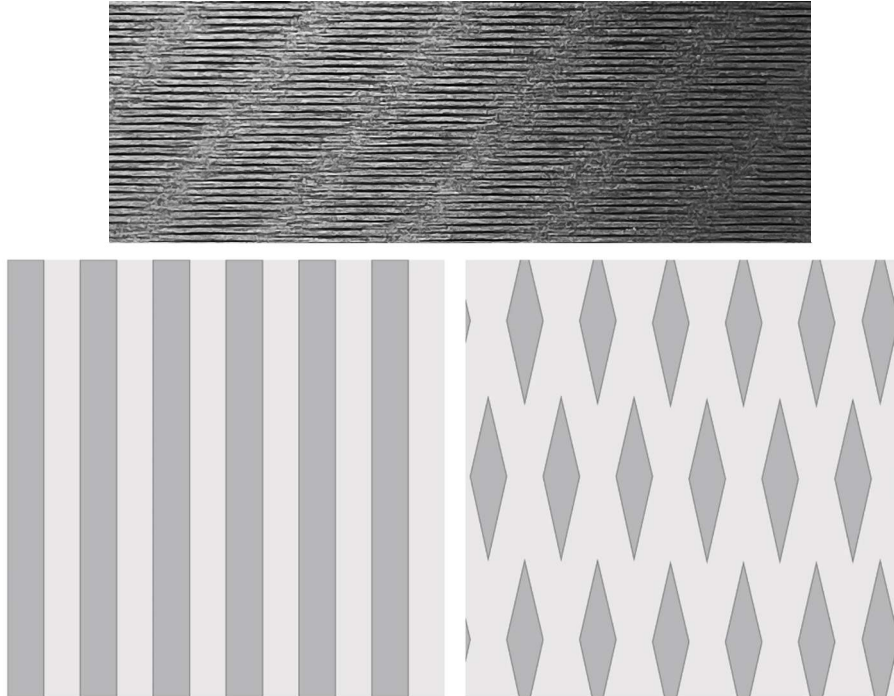
Basically, skis create friction on the snow which creates a layer of water. Very cold temperatures create less water, but the harder crystals stick into the wax more. This requires harder wax to decrease friction. Warmer temperatures create more water which involves a bit of suction, and these waxes are softer and repel more water.

Standard waxing uses an iron to melt the wax into the base and then scraping and brushing the excess wax. Paste/liquid waxes simplify the process.



**Base Edge Sharpening:** This typically happens with the original shop or set up process, and maintenance is less frequent and typically happens when the base edge has damage from a rock. This is also set up with a base grind.

**Base Structure – “Grind”:** Structure on the base of the skis is a pattern which repels water. Base Grinds happen at the factory with new skis, and can be done once again in mid-season, or the beginning of the season if the skis are used. <sup>3</sup>



### **Basic Tuning Progression**

**Phase 1: All tuning is done by a shop.** This needs to be done every 3-4 days of skiing or sooner for a race. This is dependent on snow conditions. Icy conditions will dull edges faster, but if skiing powder would require less tuning.

**Phase 2:** The next step up in the progression would be a combination of race tunes from a shop and daily maintenance. This can be done with Coarse (200 grit) and Medium (400 grit) diamond stones for side edges and application liquid wax. A blue wax set for temperatures of 10 to 21 degrees Fahrenheit is a good day-to-day wax. A fibertex pad can be used for basic base cleaning. You will need ski vises and some form of bench and could make one from sawhorses and some shelf boards or plywood. You will need a solution to spray onto diamond stones.

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<sup>3</sup> Base structure images raceplace.com

**Step up:** Add hot waxing which requires a wax iron and a hard and soft wax. Soft wax can be used for cleaning bases through a “hot scrape”. You will also need wax brushes and a scraper. A blue hard wax and a red base prep wax to clean bases. You can add additional waxes for races.

**Step up:** More involved diamond stones, add an Extra-Course (100 grit) and a Fine (600 grit) diamond stones

**Phase 3:** Adding files or home machine edge tuner to dramatically reduce the need for going to the shop.

**Max:** Higher end maintenance and “true” race tune. Use a broad range of waxes for race prep. Adding more wax brushes. Base Maintenance tools.

## Phase 2 Equipment



### List:

- Ski Vises \$175
- Bevel Tool \$30
- Ski Brake Retainers \$3
- 400 Grit Stone \$25+
- 200 Grit Stone \$25+
- Clamp \$4
- Diamond Stone Solution \$10
- Blue Paste Wax \$26
- Fine Nylon Brush \$65
- Fiber Tex Pad \$4
- Total \$370

## Step Up: Waxing



## Additional Equipment

• Wax Iron	\$80
• Red Prep Wax	\$40
• Blue Hard Wax	\$17
• Scraper	\$10
• Medium Brass Brush	\$60
• Hard Nylon Brush	\$50
• Total	\$260

## Step Up: Stones



### List

- X-course 100 Grit \$25
- Fine 600 Grit \$25
- Total \$50

## Phase 3:



### List

- Bastard Cut File \$30
- Second Cut File \$30
- File Card/Brush \$15
- Total \$75

Or:



**Razor-Tune \$700**



## **Sources of information:**

Race Place has a series of videos on You Tube which are great for basics. Like many things in ski racing there are lots of views and the technology changes over time.

### **Supply Stores**

#### **Race Place**

<https://the-raceplace.com/>

#### **RaceWerks**

<https://race-werks.com/>

#### **Reliable Racing**

<https://reliableracing.com/>

These are the companies selling a wide selection. They have a mix of the big brands such as Swix and Toko and their own brands. There are other companies offering quality products at lower prices but without branding.

Look for Presidents Weekend and late season sales.