

Alberta World Cup Academy

AST/ADT Dryland Camp

Building and Managing Ski Fleets

Presented by Patrick Moore



About Me

- Head of Technical Services for Alberta World Cup Academy
- Have also provided ski service for
 - Edmonton Nordic
 - Fast Trax Pro Team
 - Quebec Pierre Harvey Training Centre
 - US Ski Team
- Significant work with Zach Caldwell and Nathan Schultz
 - This presentation draws heavily upon their work
- Seven world cups
- Too many NorAm and Super Tour races to count
- I have a passion for fast skis!



About Me



Why are we here?

- What this discussion is:
 - An open forum to discuss the finer points of building and managing your fleet of skis
 - An opportunity to ask questions and learn best practices
- What this discussion is not:
 - An instructional session on how to wax skis
- For more information please see sources noted at the end



Why does fleet management matter?

- The average skier on the World Cup has twenty or thirty pairs of skis
 - Teams of service staff to maintain gear
 - Totally impractical for “normal” athletes
- Many athletes have too many skis
 - Misused and/or bad skis
 - Little knowledge of fleet and which skis to use when
- Goal is to have a lean and effective fleet of skis
 - Make ski selection simple
 - Reduce stress!!!



Factors Influencing Ski Performance

- There are many variables that will play into the speed of your race skis
 - Ski quality
 - Condition specific flex
 - Grind selection/base structure
 - Fit
 - Wax



Ski Quality

- Unfortunately, not all skis are created equal
 - There is significant variability within a production run and skis and even greater variability between production runs
- Fortunately, the idea that all of the “good” skis are sold in Europe just isn’t true
 - Outside of the World Cup skis, the distribution of skis worldwide is entirely random
 - There ARE good skis in Canadian shops!!!



Condition Specific Flex

- Each ski has a unique flex pattern that interacts with the snow and the skier to determine stability, speed, acceleration, liveliness, etc.
 - Fitting a ski correctly to the snow is at least as important as fitting the ski to the skier
 - Soft/hard track, snow type, moisture level, etc.



Condition Specific Flex

- Pressure distribution – relative concentration of pressure at the ski's contact point with the snow
 - Hot – high moisture
 - Cool – low moisture
- Stiff vs. soft is really not the whole picture



Ski/Athlete Fit

- Ultimately, skis still need to fit in order to work
 - This is especially important with respect to classic skis
- Need to consider weight, skiing style, track conditions, etc.
- The idea that there is one flex that fits a particular athlete is an oversimplification



Camber

- Camber is the height of the ski from the snow
- Combines with the flex and construction of the ski to form the feel and stiffness
- Particularly interesting for classic skis
 - Determines how the ski should be waxed
 - Thickness of the application
 - Feathering at the end of the kick zone
 - Cushion – where and how much



Classic Camber - tips

- At the most basic level, three basic type of classic skis with specific characteristics to look for
- Cold hardwax
 - Long, low pocket, that opens up when the weight is on the heel, and closes flat with no residual camber
- Warm hardwax
 - Long, medium height pocket, that closes flat with no residual camber
- Klister
 - Shorter, tall pocket that takes an active impulse to close, should have some residual camber



Building Your Fleet

- Avoid brain damage
 - This process sounds pretty complicated
 - It is easy to feel overwhelmed → don't
- It is far more effective to have small, well tested and well selected fleet, than an enormous number of skis that you don't know anything about
- We will help by providing recommendations on how to use and fill in your existing fleet



Building Your Fleet

- Think about where you live and race
 - Primarily Western Canada
 - The weather is typically cold and it doesn't snow that much
- Skate
 - Cold – technicians can add temporary hand structure for warm conditions
 - Warm
- Classic
 - Cold hardwax – the most used classic ski in Western Canada, wax application can be adapted for warmer conditions
 - Warm hardwax – can be adapted for klister as necessary
 - Klister – very specific ski



The Bottom Line

- Two pair fleet
 - Dedicated cold skis → both skate and classic
- Building from there
 - Universal warm classic
 - Universal warm skate
- Hand structure tools can make your skis competitive in any race, given the right starting point



The Bottom Line

- Knowledge is power
 - Understand your skis
 - Which ones to use in which conditions
 - Avoid unnecessary testing
- Trust is important
 - You need to be confident in the skis you have
 - If you have questions about your fleet, let's talk



Preparing for Winter - Grind Selection

- Grind selection matters
 - It matters a lot!
- In testing that I have personally done the difference between the best and worst grinds has been up to 9%
 - That translates into 3:36 over the course of a 40 minute race!
- **Universal grinds should be selected as a starting point and adjusted with hand structure**
- **This is free speed with absolutely no effort**
- **Trail Sports, Boulder Nordic Sport**



Preparing for Winter -Base Conditioning and Prep

- In order for your wax application to be durable the base needs to be saturated
- This will happen after about four applications of a soft wax
- Heatbox is also a good option (Fast Trax, Trail Sports)
- Once saturated, the base also need some conditioning
- It is important to layer some harder wax on top of the saturating wax – CH4, 155°C iron, one pass
- Aggressive razor or fibertext application = ☹️

1. Soft – CH 10



2. Soft



3. Soft



4. Soft



5. Hard – CH 4



Taking Care of Your Gear

- Minimum basic tools
 - Bench
 - Ski forms
 - Iron
 - Scrapers (grip/glide/groove)
 - Keep your scraper sharp, it will work better
 - Soft steel or bronze brush
 - Cork
 - Wax remover (grip)
 - Rags
 - Apron



Glide Wax - Safety

- Waxing is bad for you
 - Make sure your work area has adequate ventilation
 - Do not expose wax to open flames
 - Do not overheat – fluorocarbon disintegrates at high temperatures and turns into a poisonous gas
 - Wear a mask – cartridge type for filter organic vapours - mandatory if waxing many pairs of skis



Glide Wax - Ironing

- Clothes iron \neq wax iron
 - That old clothes iron that wasn't fit for your dress shirts anymore was never fit for your skis
 - Clothes irons have wild temperature variations = burned bases
 - A real wax iron is not optional



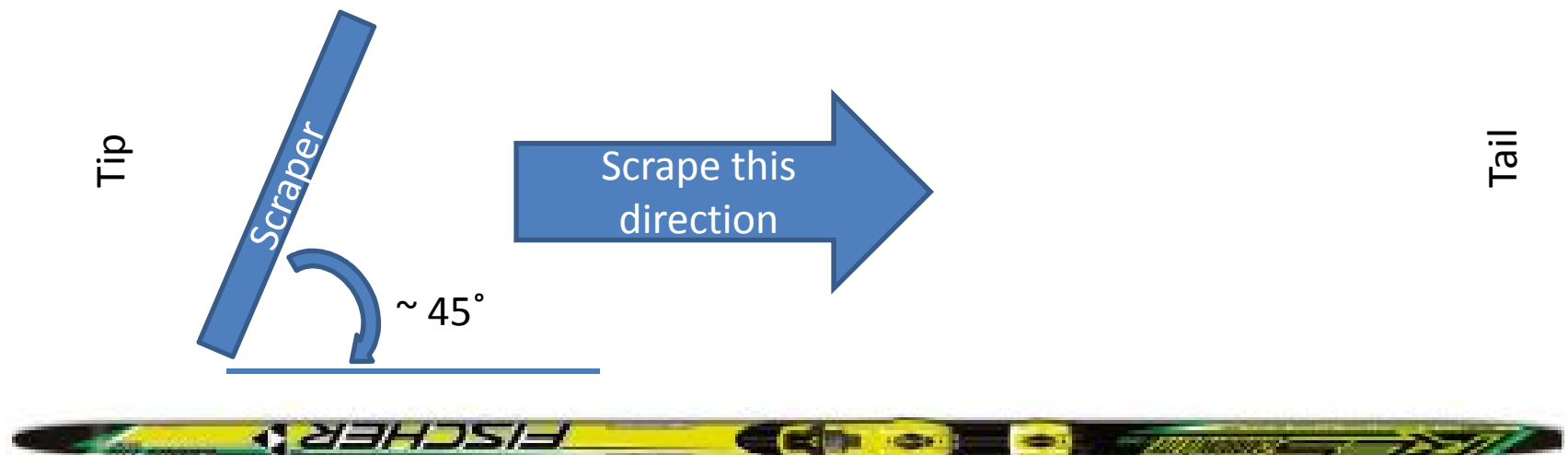
Glide Wax - Ironing

- Important Rules
 - Use an iron made for waxing to avoid temperature swings and ruined bases
 - Keep the iron moving at all times – not too slow, look for a small trail of liquid wax, puddles are not good
 - Three quick passes is plenty - don't overheat
 - Iron inside at with the skis at normal room temperature – in other words a hot iron never touches a cold ski
 - Use the correct temperature setting – most people iron too hot and destroy their bases



Glide Wax - Scraping

- Scrape in this direction:



Frequently Asked Questions

- I've finished saturating and conditioning my new skis – how do I maintain them?
 - The wax in your base seeps out over time
 - Skis need to be waxed regularly
 - Always using one type of wax (hard or soft) will result in slow skis
 - Even cold skis should be waxed with something warm from time to time to keep them saturated



Frequently Asked Questions

- What are common forms of damage and how can they be prevented?
 - Small scratches – not a big deal, results from normal use; use old skis as rock skis when appropriate (early season, marginal conditions, etc.)
 - Non-flat bases – *usually* not a big deal, happens naturally over time; use the appropriate iron temperature
 - Dry/white bases – *usually* not a big deal, results from abrasive conditions; wax your skis regularly
 - Black wax shavings – *may* indicate a problem, results from overheating or infrequent waxing; wax your skis regularly and use the appropriate iron temperature
- Always put a protective layer of wax on your skis before travelling
- Always travel with ski ties on your skis



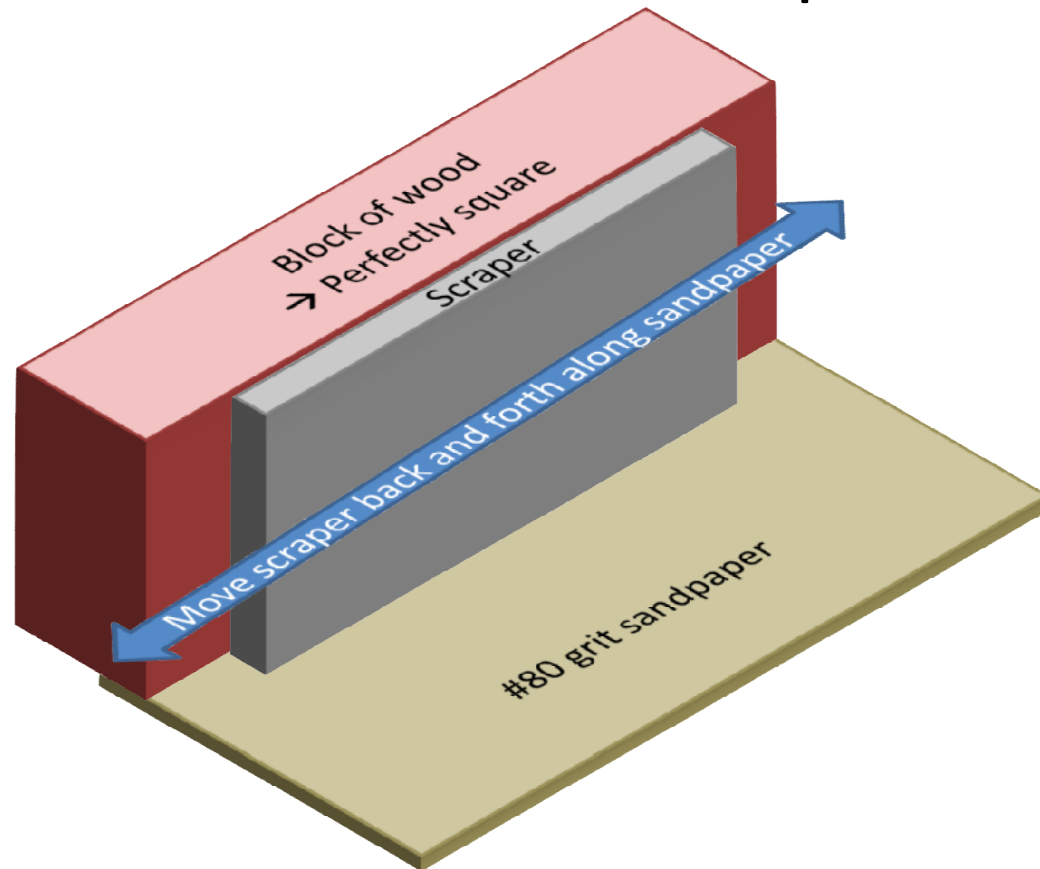
Frequently Asked Questions

- You said that I need to keep my scraper sharp – how in the world do I sharpen a scraper?
 - Using a perfectly square block of wood as a guide, run the scraper back and forth along #80 grit sandpaper until it is sharp
 - Follow with fine grit sandpaper to remove burrs
 - Ensure that there are no burrs or curves in the cutting surface of the scraper



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Frequently Asked Questions

- You said that I need to keep my scraper sharp
 - how in the world do I sharpen a scraper?
 - Alternative option is to use a scraper sharpener
 - Swix, Toko, and Holmenkol have good choices



Frequently Asked Questions

- What is the golden rule of ski maintenance?
 - Hippocratic Oath – do no harm
 - Skis are heat sensitive – bases melt at 130°C, the core melts at 70°C → use enough wax and keep the iron moving
 - Dull and dirty tools cause damage – keep your scraper sharp and your brushes clean

- Burned bases absorb no wax
- Bases without wax are slow
- Slow skis = ☹️



Frequently Asked Questions

- I'm travelling with my skis – what should I do?
 - Travel wax – crucial, apply wax most likely to be useful and your destination
 - Travel with clean skis – remove kick wax
 - Ski ties to keep bases together – firm, but not tight
 - Ski bag to keep skis from moving around and objects damaging the base
 - Skis should be pointing the same direction in the bag
 - Foam covers for poles – available at Home Depot, etc. in the form of plumbing insulation



Frequently Asked Questions

- How should I organize my wax box?
 - Your wax box can be as simple as a small tool box or fishing tackle box
 - Lids on klister – you only have to learn this lesson once
 - Lids on kick wax – to keep supple and avoid contamination
 - Glide wax in boxes – for temperature recommendations and to keep clean
 - Grip equipment (scrapers, corks) separate from glide equipment



Athlete Wax Box

- Doesn't need to be complicated, just sufficient for training
- Know your options
- Coaches will take care of race wax
- The following pages have some of my favourites, but there are many great waxes to choose from



Athlete Wax Box - Glide

- Must have options
 - Solda Techno Red or Performance Red or Swix CH6 (blue) → all have extremely wide range
 - Solda Techno Green or Swix CH4 (green) → excellent when it's cold
- Nice to have
 - Ski*Go LF Violet → excellent in Canmore
 - Solda F15 Violet → unbelievable range, gets raced on a lot
 - Swix LF4, LF6 (like the CH waxes noted above, but faster)



Athlete Wax Box - Grip

- Must have options
 - Swix V series
 - Blue Extra → your most used wax by far
 - Violet Special → for when Blue Extra isn't enough kick
 - Red Special → for when it's warm
 - Start MFW
 - An alternative to the Swix V series
 - Blue, Red, Purple
 - Rode
 - Multigrade
- Nice to have
 - Ski*Go HF blue → amazing range
 - Guru Halgier → for old, aggressive snow
 - Klister → Start Universal Wide



Questions?



Sources

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