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BRINGING WORLD CUP SERVICE TO EVERYONE



BOULDERNORDICSPORT

WINTER 2010-11

HOLMENKOL®

SKI*GO



BY NATHAN SCHULTZ

Last season was a whirlwind for us at BNS. We took over US distribution for Holmenkol and Ski*Go in the US, launched our satellite store in Portland, Maine, and expanded our offerings in products and services nation-wide. In February, Zach and I worked with the US Ski Team at the Olympics, while Roger tackled service at the American Birkebeiner on only two weeks notice. It was a scramble, but well worth the stress as it moved us far ahead in our mission to bring World Cup service to the US skiing community.

I was energized not only by the Olympics, but by service trips to the NCAA's, high school races, and local and regional races in Colorado, Maine and New Hampshire. I got a charge out of talking with coaches and customers from all over the country about wax, equipment and technique and by working with athletes at our camps this past summer in New Zealand and our training groups right here in Boulder. I believe that the knowledge we're gaining and passing along is making a difference in the sport. The more people we work with, the more our sport grows and the more the ski community learns and progresses.

To keep this progress on the move, we're launching BNS Mobile. Eric Pepper, one of BNS's original employees, will be hitting the road with a BNS mobile store to expand our World Cup Service to events across the US. BNS Mobile will allow us to improve our testing/recommendations, offer professional waxing services, and provide a mini-BNS to help skiers when they need it most – at the races. Details and the schedule of our biggest events are on the facing page. We look forward to seeing you at the races.

I have to reduce my ramblings this year to make room for the massive amount of new material we have in this edition of the BNS mag. We've developed the "BNS Ski Service System," a comprehensive description of ski service from start to finish on pages 4-21. We have also expanded and clarified our wax and product catalogs to give more useful descriptions of each item, along with when, why and how you might want to use them.

Even though we've expanded to 48 pages, this magazine represents only a small fraction of what we have published online. Don't miss out on the supporting video, expanded information and full product catalog available at bouldernordic.com.

Enjoy the season, have fun skiing and let us know what we can do to make skiing better for you! suggestions@bouldernordic.com

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BNS MOBILE KEY EVENTS

These races are the premier events in the country and BNS is proud to support them. You'll find full BNS Mobile support at these events and many more throughout the winter. See bouldernordic.com for the full schedule.

WEST YELLOWSTONE SKI FESTIVAL NOV 21-28, 2010

For over 30 years, cross-country skiers from around the world have traveled to The Yellowstone Ski Festival in West Yellowstone, Montana to begin their ski season on the Rendezvous Ski Trails. The Yellowstone Ski Festival takes place during Thanksgiving week. The event's highlights include a series of Nordic skiing clinics, SuperTour races, Biathlon races, the Try It and Buy It Gear Demo (the largest public gear demo of its type), an Indoor Ski Show, and a variety of presentations, clinics, and classes.



NOQUEMANON JAN 29, 2011

The Noquemanon trail has been described by some as "the most beautiful trail I have ever skied on," by others as "never dull," and by a few as "deceptively tough." It's fair to say that the Noquemanon trail has many faces, ranging from gently rolling hills and flat lake crossings to testing climbs and plenty of downhill. One thing, however, remains constant: the beautifully rugged U.P. wilderness that surrounds skiers throughout the course.



ALLEY LOOP FEB 5, 2011

Crested Butte's signature Nordic event, the Alley Loop, starts and finishes on Elk Avenue in downtown Crested Butte, winds through the alleys of the town's historic district and then out onto the scenic trails of the Slate River Valley. With distances of 1.5k all the way to 42k, it's a race for everyone and all abilities, and it's also a Birkebeiner qualifier. From the silliest to the most serious racers, costumes are encouraged. Set aside the first weekend in February for this classic event. For more info visit cbnordic.org or email director@cbnordic.org.



BOULDER MOUNTAIN TOUR FEB 5, 2011

As one of America's longest running and most respected cross-country ski races, the SWIX Boulder Mountain Tour is Sun Valley's winter treasure. Drawing a field from across the country, and across the spectrum of abilities, the BMT welcomes all. The race traverses the spectacular Boulder Mountains for 32 kilometers of breathtaking beauty and world class competition. Some of the finest skiing anywhere combined with warm hospitality and first rate race organization.



BNS GOES MOBILE

This winter, the BNS Mobile Service Rig hits the road, pushing our goal of "World Cup Service for Everyone." At events across the country, BNS mobile allows us to provide race waxing services and our mobile store front showcasing wax, tools and other great gear. We can do a better job testing wax and you can get the fastest wax of the day at the race site.

BNS RACE SERVICE CALENDAR

Below is a sample of races that will have full BNS Mobile support. While your competitors stress about which wax to use, where to get it and how to apply it, you can relax after you drop off your skis with our professional service crew. Like a World Cup racer, you'll pick up your skis race-ready with the best wax and structure applied so you can focus on your race.

Want to do your skis yourself? No problem. Drop by BNS Mobile, ask us about our test results, get advice and grab whatever wax you need at our mobile store.

EVENT	DATE	LOCATION
West Yellowstone Ski Festival	11/21/10–11/28/10	West Yellowstone, Montana
Noquemanon	1/29/11	Marquette, Michigan
Craftsbury Marathon	1/29/11	Craftsbury, Vermont
Alley Loop	2/5/11	Crested Butte, Colorado
Boulder Mountain Tour	2/5/11	Sun Valley, Idaho
City of Lakes Loppet	2/5/11–2/6/11	Minneapolis, Minnesota
UVM Carnival/Eastern Cup	2/5/11–2/6/11	Stowe, Vermont
Mora Vasaloppet	2/13/11	Mora, Minnesota
American Birkebeiner	2/26/11	Hayward, Wisconsin
Masters World Cup	3/3/11–3/11/11	Sovereign Lakes - Vernon, BC

We raised the bar in wax testing and recommendations in 2009–2010 by testing multiple brands of wax and testing at a professional level, using the same methods we use to test skis in our work as technicians at World Cups, World Championships and the Olympics. One of the things that most excites us about our new mobile setup is that it enables us to do more on-site testing and provide more feedback on waxes, grinds and ski flexes. The direct benefit will be an increase in quality and quantity of our wax recommendations as we continue to push the standard higher.

Go to bouldernordic.com for a complete schedule of events we will support in the 2010–2011 race season as well as the latest updates to this list.

WAX RECOMMENDATIONS

There are two types of wax recommendations: testing-based and forecast-based. It is important to distinguish the difference between the two so you know when you can trust them explicitly or when you might want to do verify the suggestions with your own testing.

TESTING-BASED RECOMMENDATIONS

Testing-based recommendations are made by putting skis on snow in conditions that best represent race conditions and comparing waxes or other variables directly. This is done using a speed trap and/or by ranking the skis by how they feel on the snow. This type of recommendation is the most reliable as it is supported by data gathered in race conditions. As long as the tester does a professional job using matched test skis, you can generally trust this type of recommendation and follow these suggestions with confidence.

FORECAST-BASED RECOMMENDATIONS

Forecast-based recommendations are made by analyzing current snow conditions and the weather forecast without actual on-site testing. While this type of recommendation is useful, there is more room for error and the quality of the recommendation depends more on the experience and knowledge of the person making the recommendation. Fortunately, there is a lot of easily accessible weather information out there nowadays and an experienced wax tech can make a highly educated guess. But you should be aware of the qualifications of the person making the recommendations and on what they base their assumptions. It is always smart to back up this type of recommendation with your own on-site testing and one or two alternatives in case the prediction is way off.

FOR MORE INFORMATION ON HOW TO TEST SKIS AND WAX FOR YOURSELF, SEE PAGE 11. 

BNS MOBILE KEY EVENTS

SUN VALLEY NORDIC FESTIVAL JAN 29–FEB 6, 2011

The Festival will be celebrating its second year offering nine days of events culminating with the Boulder Mountain Tour. The week is geared for all levels of skiing from family touring to high level racing.

HALF BOULDER For 2011 the BMT will once again host the "Half Boulder," a non-competitive tour for those skiers new to the sport or not ready for the full distance race. The 15 kilometer event will begin at Baker Creek and finish with the rest of the field at the SNRA Headquarters. Check BoulderMountainTour.com for all the info.

CITY OF LAKES LOPPET FEB 5–6, 2011

The City of Lakes Loppet is the largest urban ski race in North America. Starting in the hills and woods of Theodore Wirth Park with views of downtown Minneapolis, and finishing on the streets of Uptown, Minneapolis, the Loppet is a unique event with something to offer to skiers of all abilities. Don't miss the Luminary Loppet - a night time tour of Lake of the Isles lit by a thousand ice luminaries the night before the race.



MORA VASALOPPET FEB 13, 2011

Experience the Vasaloppet, renowned for its hometown hospitality, volunteer spirit and five races that challenge the expert racer and touring novice alike. Enjoy the dynamite starts, Swedish blueberry soup and the downtown finish line.

Races include 58km, 35km, and 13km freestyle, 42km classic, and the Vasaloppet Relay.



AMERICAN BIRKEBEINER FEB 26, 2011

The Birkie is a year-round lifestyle choice for thousands of outdoor fitness enthusiasts of all levels. From its signature ski race - the legendary American Birkebeiner—The Birkie has grown into an exciting array of fitness and recreational opportunities. The 88-kilometer Birkie Trail system attracts skiers, runners, bikers, trekkers, and hikers, from casual day-trippers to elite superstars. Located near Hayward and Cable, Wisconsin, the Birkie is now an outdoor sports mecca, a series of great races, a fitness destination, and a lifestyle. Ski. Run. Live!



MASTERS WORLD CUP MARCH 3–11, 2011

The 2011 Masters World Cup will be in Silver Star, British Columbia. The MWC is the world championships of cross-country for skiers 30 years of age and above. The event attracts 1,100 to 1,400 racers from over 20 countries. The event lasts a week with daily classic and/or freestyle ski races ranging from 5 to 50km in length and is located at one of North America's hot spots for skiing. BNS will provide race waxing services as well as host a trip to the event. See page 46 for more information on the BNS trip to MWC 2011.

PERFORMANCE FACTORS

Conventional wisdom ranks the factors governing ski performance in priority: ski quality and flex characteristics are most important, followed by base quality and grind selection and, finally, by wax. What hasn't been emphasized is the additive nature of these factors. The quality of your skis may play the largest role of any of the factors governing performance on a given day, but you still need the right structure and wax to compete. We think of a complete and successful ski preparation job as a process that starts when the skis are selected, and ends when the race starts.



“You don't put expensive tires on a 1982 Honda Civic and expect it to go fast, so why do you expect a fancy wax job to make this lousy ski go?”

– Nathan Schultz



SELECTION

SKI SELECTION – THE FOUNDATION FOR SUCCESS

The right pair of skis for the day can make a difficult sport seem easy. You can put a perfect grind and wax on the wrong pair of skis, and have a miserable and frustrating experience. Finding the right skis is a prerequisite for success.

There are two main factors to be addressed in ski selection: Absolute quality is the single most important factor governing ski performance. A great pair of skis tends to be good in a broad range of conditions. Even at high levels where racers carry multiple pairs of skis, many depend largely on a single pair to cover an extraordinary range of conditions. This is testament to the importance of absolute quality.

Specific flex characteristics are the second component of ski selection. Matching the shape and flex characteristics of skis to the skier and the conditions contributes greatly to this foundation of success. We discuss the elements of quality and flex characteristics at length on page 6.



MANAGEMENT

FLEET SETUP – A STEP TOWARD SUCCESS

On race day you will be faced with several decisions that can affect the success of your ski preparation. Skiers struggle with uncertainty on race day: Which skis to use? How to set them up? Fleet setup is the process by which ski flex characteristics are matched with grinds to target a range of conditions. A good fleet setup facilitates effective race-day decision making and prevents the brain damage of “analysis paralysis.”

A good fleet setup depends first on skis of high absolute quality. A good understanding of the characteristics of the skis combined with the racer's knowledge and experience provide the rest of the package. All of this information builds an understanding of which skis are best suited to which conditions, and appropriate grinds are chosen to suit the conditions. The confidence that you know which skis to use in which conditions simplifies race day. For more on Fleet Management and Grinding see pages 8–9.



GUIDING PRINCIPLES

The reason ski service sometimes seems so confounding is that any one of these factors can trip you up. The goal of the BNS Service System is to provide a framework that helps you identify and learn about every step of the process so you can put together a winning solution. Throughout our service work and throughout this magazine, we focus on three guiding principles to keep you on the path to success:

QUALITY of materials. Whether we are discussing skis and grinds or highlighting waxes and tools, quality is always our major emphasis.

SIMPLICITY is the second major emphasis in the BNS System. Maintaining simplicity in your equipment setup and working procedures clarifies how and why you work with your skis and waxes. Avoiding unnecessary complication keeps ski service manageable and fun.

EFFICACY is the final emphasis of our system. We want the energy that you put into your skis to yield a great return, and so we've focused attention on the areas where the greatest benefit can be found.

“Hey BNS guys. I had a fantastic Birkie on the skis that I bought from you just a couple weeks ago and that your man from the East Coast store waxed for me in Cable!”

- Mark, Maryland



WAXING

WAXING – HOMING IN ON SUCCESS

After you've chosen your skis, the most important thing you can do on race day is make sure that your wax is good enough. While wax may not provide the greatest part of the complete package, it is the most available on race day to tune the performance of your skis. Don't reach for large advantages by speculating on unpredictable circumstances or gambling on unproven wax. Start with high-quality skis, make the wax competitive, and you'll never be out of the race.

In our methodology race waxing involves both paraffin and fluoro powder layers. Read about why and how to apply these products on pages 12–15, along with some recommendations of our favorites, and decision-making guidelines.

Optimize |op-tuh-mahyz| *verb* to make as perfect, effective or functional as possible.



OPTIMIZATION

OPTIMIZATION – REACHING FOR AN ADVANTAGE

Optimization is the process where you can turn good into outstanding. Optimizing layers are the final adjustments that you make to your skis – the hand structure and rub-on or liquid fluoro applications that refine the performance of your skis to the final degree. Because conditions are unpredictable, all the work you do up to the minutes prior to race start must be broad-range and general in nature. The combination of well-selected, high quality skis with a great, versatile grind and a safe and conservative broad-range wax job will always produce good results.

As a percentage of the whole package, the difference made by optimizers is small – not more than a percent or two at most. However, on the race course small advantages compound and multiply as you carry added speed from stride to stride. We've seen the biggest advantages on race day tests and the most effusive feedback from racers when we nailed the optimizers. As service techs, we put more time and energy into testing and refining these optimization steps because that is where we get the best return on our investment.

Read up on why and how to apply hand-structure and fluoro optimizers on pages 16–19.





SKI QUALITY

UNDERSTANDING INTANGIBLES – THE SECRETS OF QUALITY

When we started picking skis we depended heavily on quantifiable and reproducible measurements. This meant carrying our flex testing equipment to warehouses and measuring every single ski that we considered taking. This was time consuming, but also rewarding. The quality of the product that we picked was superior to what we would get from a random selection of skis.

Since 2002 we've carefully analyzed approximately 25,000 pairs of skis with our flex testing equipment. We've worked with elite athletes and systematically tracked the characteristics of skis that were succeeding at the highest levels. We've listened to the engineers who design and build the skis, and learned from the waxers who work on the World Cup. We've changed the shape of skis by remolding them in the hot box to see if we could change their performance characteristics. Over time, we've refined our skills to correlate flex testing data to what we feel and see in skis, and to what we experience on snow. We've always worked conscientiously to pick good skis, but with thousands of hours of work and testing we've gotten better at the game. We've learned exactly what we're looking for, and now we do most of our ski selection work by hand.

The ski companies have helped our cause by dramatically improving their production techniques as well as their post-production quality control and ski matching. Because we don't have to spend as much time identifying well-matched pairs, we have been able to focus our attention on identifying quality. This frees us to spend more time matching the skis to specific characteristics people are seeking: i.e., a cold, hard-pack skate ski or a fantastic all-around ski for the upper Midwest.

The number of skis we have picked that made it into elite fleets has risen as we have refined our methods. Last year Kris Freeman finished 4th in the Kuusamo World Cup on a pair of skis that Zach picked and stone ground at BNS. When the work we do supports the best performances of athletes competing at the highest levels, we know that we're achieving our goal of "World Cup Service for Everyone."



DEFINING QUALITY: PERFORMANCE FACTORS AND VARIABLES

Some quality factors are absolute and determine the difference between great skis and mediocre skis. These are the more subtle factors that we have learned to recognize over the thousands of pairs of skis that we've analyzed and with knowledge gained from the many World Cup technicians and factory engineers with whom we've worked. Understanding quality boils down to understanding the specific characteristics and behaviors of the materials used in manufacturing.

We gain this understanding by spending a lot of time testing skis on snow. We work closely with high-level athletes on many different brands. We travel to Europe to visit the ski factories and meet with the engineers and racing service personnel who develop and support the products in order to better understand what the companies are trying to do. Anybody in the ski industry will tell you that all companies make great skis. The trick is learning to recognize the great skis when you have your hands on them.

Other quality factors are relative and apply to the skier and the conditions. These are the same flex and camber characteristics we've looked at and measured for years, and we still pay plenty of attention to them.

translate the skier's energy into motion. Resting camber shape and an understanding of the behavior of the materials and construction of the ski provides a really good preview of the camber action. We also assess camber action by hand or on the flex tester.

LOAD DISTRIBUTION The proportional distribution of the skier's load between the front and rear running surfaces. Appropriate load distribution is the largest governing factor in fitting skating skis. There is a large range of skis that will fit a given individual for a variety of conditions, provided the relative load distribution is within acceptable parameters for the materials and design of the ski.

PRESSURE DISTRIBUTION The shape of the downward force applied by the loaded ski to the snow. Pressure distribution is one of the largest considerations in picking skis for specific conditions with respect to moisture content.

"I purchased a pair of RCS classics from you a couple of months ago. At the time I was a little skeptical of all the high-end flex testing, precise wax zones by layer, etc. Being a middle (back) of the pack skier, I figured I wouldn't even notice and it would be a waste. Was I wrong—I love these skis! Can't believe as fast as they are on the downhills, (I've out-glied skaters several times) that they climb so well. But most importantly to me, they make just going out and cruising so much more enjoyable. Even if I never race them, they're worth every penny. Thank you!"

- Tony, Boulder, CO



FLEET MANAGEMENT

Snow conditions vary from soft to hard tracks and from dry to wet snow, all involving a range of possible snow crystal sizes and shapes. A selection of different ski characteristics and grinds is required to best handle the various conditions that a ski racer will encounter. However, it's equally important to understand that with each additional ski/grind combination, an additional variable is added, and an additional decision must be made in preparation for racing. World Cup skiers sometimes have a whole lot of skis (we've heard of individual fleets of 60–70 pairs of skate skis for some biathletes) but this depends on having a well-organized and professional service staff to support the fleet. For self-supported individuals, or even for domestic teams with coaches pulling double-duty as wax technicians, it's necessary to limit the fleet to a manageable size and know it well enough to make good, fast and informed decisions on race day.

The BNS Fleet Management service is an individualized process by which we work with clients to assess their existing skis, identify gaps, select grinds, and provide guidelines for race-day decision making. Our goal is to ensure that you have the skis you need to succeed in your target competitions, while maintaining confidence and simplicity in the decision-making process. In order to achieve this goal we work with some basic principles:

1. QUALITY FIRST

Our first goal is to ensure that all of your potential race skis are of good absolute quality. An investment in a sub-standard pair of skis is a waste of time and money, and a distraction from effective decision making.

2. PROVIDE BROAD-RANGE SOLUTIONS

Snow and course conditions are endlessly variable and unpredictable. Even at a World Cup level the most valuable skis and grinds are those with excellent performance characteristics in the widest range of conditions. We make it a goal to avoid over-specializing your fleet of skis, and to ensure that your skis can gracefully handle unpredicted circumstances and varied snow conditions during races.

3. CREATE CLEAR DECISIONS

Our goal is to equip you with the right setup and knowledge so you know which pair(s) of skis will perform given a particular condition. This makes it easy to decide which skis to test and which to leave in your bag on any given race day. We accomplish this by establishing overlap in grind selection and ski characteristics so you have options to handle any condition while maintaining clear distinctions between skis so you don't have to test everything every day.

4. MAKE THE RACER AN ASSET

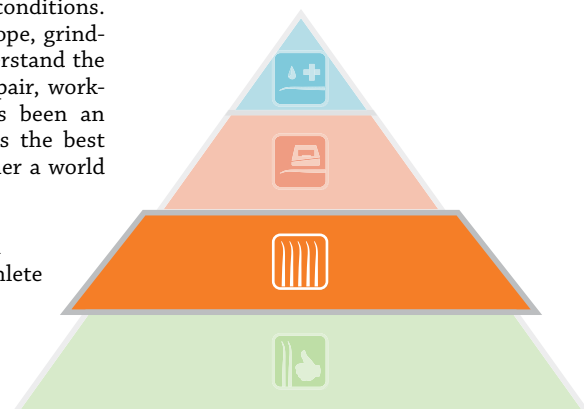
When it comes to ski preparation on race day, a racer can be his or her own best ally or worst enemy. An informed and confident racer will make fewer and less severe mistakes and not waste energy on skis. Our goal is to provide you with the information that will give you the confidence needed to succeed without stress.

Contact BNS to begin building a fleet of skis that will provide the foundation for confidence and success. We carry a large selection of the highest quality Fischer, Madshus and Rossignol race skis available anywhere.



Working with BNS on putting together my fleet has taken a huge burden off my shoulders and given me confidence that I have a range of great skis to cover all conditions. From picking skis in Europe, grinding, and helping me understand the ideal condition for each pair, working with those guys has been an invaluable service. This is the best option for putting together a world class fleet in the US.

- Noah Hoffman
US Ski Team Athlete





ABOUT GRINDS

GRIND QUALITY

As with skis, grind quality is fundamentally important for the best performance. High quality equipment is a big asset in creating high quality grinds, but the human factor is much more important. We've seen fantastic quality grind work coming from rudimentary twenty-year-old machines, and we've seen disappointing work come from the very latest and most advanced machines. Grinding is a methodical and repetitive process and standards of quality must be built into every part of the process to ensure a high-quality surface.

FACTORY GRINDS

When Kikkan Randall won the World Cup sprint in Rybinsk in December of 2007 she was on a Fischer factory grind. Factory grinds from all companies get used frequently on the World Cup, and have won many medals. However, this use of terms is misleading. Every ski company has a racing department, and they all produce high quality grinds by hand for use on the World Cup. But these "factory grinds" are quite different from the ones produced on an automated assembly line in the production facility. The requirements of a production environment limit the type of work that can be done without adding tremendously to costs. While every ski company has recognized the need to improve their production grinds, and while the quality of the work has gotten steadily better over time, the grinds produced on the factory floor are not of World Cup-quality. As it stands, factory grinds produced on an automated assembly line are considerably better than the worst aftermarket grinds out there.

Factory production grinds are often "good enough" on the domestic citizen racing circuit. We provide a higher quality option. Over 90% of the new skis that we sell are reground before they ever see the snow.

GRIND CHARACTERISTICS AND PARAMETERS

The absolute quality of the work is the first consideration in grinding, but we also have to pay close attention to characteristics that govern the suitability of grinds for specific conditions. The number and variety of structures that can be made is, in practical terms, unlimited. The parameters we're working with in structure design include:

DEPTH – The depth of the structure on the ski generally falls in a range of 0.01mm to 0.06mm. Deeper grinds have higher volume and steeper profiles, and are therefore capable of managing a lot of moisture. But they create high levels of mechanical friction because they are sharp and rough.

FREQUENCY – Frequency is the spacing of the lines that are cut into the stone. Line frequencies run from about 7 lines/cm to about 40 lines/cm, resulting in line spacing between about 1.4mm and 0.25mm. Depending on the grind, line frequency generally needs to be tuned to crystal size and shape for optimal results.

PATTERN – We refer to a grind pattern as the specific combination of depth and frequency of cut(s) made in the grinding stone. Each time the stone is cut, a diamond traverses the spinning stone, resulting in a thread pattern cut into the stone. Multiple thread patterns cut into the same stone will create interference patterns that are often clearly visible on the ski.

Sometimes testing shows that big differences in pattern make no meaningful difference on the snow, while other times very minor variations make large differences. With the huge amount of time we spend in development and testing, we have identified general relationships between pattern types and snow conditions but sometimes it can be surprising what works.

TEXTURE – Grind texture is the element of structure most difficult to define, the most difficult to control, the most difficult to reproduce and the most difficult to understand. It's also the most important, by far. Patterns are the framework of the grind – the gross shape defined by the cut on the stone. Texture is the subtle differences that create wide variations in shape and character on the surface of the ski base. Using the same cut on the stone, we can make very different textures on the ski by varying the feed speed and pressure. One simple example of texture variation would be a sharp structure versus a rounded one. There are many other textural variations similar to this. Texture is where art meets science in grind development and production.

An extended discussion of snow characteristics along with regional weather and climate issues are included in our complete grind menu. It is available at bouldernordic.com.

THE PROCESS



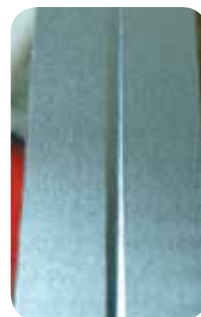
BEFORE stone grinding flattens the ski base and removes a thin layer of damaged base material, refreshing the base to increase wax absorption and adding microstructure to optimize speed. Here we see a tired ski with some scratches. Notice the dull, inconsistent areas.

STEP 1: FLATTENING Skilled techs use razor sharp metal scrapers to quickly peel damaged base and reveal a refreshed, leveled base. This step takes a very skilled hand. Skis are then fed through the stone grinder 2 to 5 passes with an aggressive structure to remove imperfections created by the hand work.



STEP 2: POLISH Next skis are "blanked" or "polished" using 4 to 10 passes on a completely flat cut on the stone grinder. This erases all structure on the base.

STEP 3: FINAL STRUCTURE The final structure we want for the ski is cut into the stone and test skis are run through and verified under microscope. Once the stone is cut correctly, skis are fed through at the right speed and pressure to get the desired grind. Some structures are combinations of 2 or 3 final structures, so we have to re-cut the stone, run a test ski, and then run the second or third pass on the production skis.



STEP 4: POST GRIND We clean skis with water and/or isopropyl alcohol to remove any contamination from the grind water and then brush with a specially modified steel rotobrush to remove any hairs created by the grind process. The skis are then brushed with a fine fibertex pad.

STEP 5: SATURATION The ski is then waxed with a very low melting point wax to saturate the base and fill the voids in the ski with wax. At this point, some skis are put in our hot box (ski oven) at low temperature for 8+ hours to increase wax penetration.

STEP 6: HARDENING Once the skis have cooled, the bases are ready to be hardened to keep snow crystals from penetrating the base and slowing the ski down. We scrape the saturation wax and apply another layer of harder wax. We put the skis in the hot box for 2 hours, cool, scrape, and the ski is ready to hit the snow. See page 13 for special race hardening procedure.

WHAT TO AVOID: BAD GRINDS EXPOSED

We generally try to focus on what we at BNS do well, however, given the huge number of skis we see every year that are nearly destroyed by inexperienced or ill-equipped stone grinding outfits, we feel it's useful to outline the reasons skis get ruined so you can avoid them.

STONE QUALITY – A grind stone is like three-dimensional sandpaper. Most of the stones used for work on alpine skis are very coarsely abrasive—like 80-grit sandpaper. These stones remove a lot of material with each pass, making for fast work – particularly on metal-edged skis. A good stone for cross-country skis is much finer—like 220-grit sandpaper—and it produces a much smoother and cleaner surface, along with better pattern definition. These stones work more slowly, and are not common unless a shop is set up specifically for XC race tuning.

GRIND PRESSURE – Cross-country ski bases have much less surface area than alpine, and therefore the pressure applied to the ski needs to be reduced correspondingly (80–85% less!) in order to avoid overheating.



Tazzari machines and our special stones leave skis remarkably clean relative to other brands of machines. We chose Tazzari because they are specifically made for cross-country skis, they have the most advanced functions available and Tazzari grinds are race-ready from the start with less prep work.

SIMPLE GRINDING MENU

K.I.S.S. STANDS FOR "KEEP IT SIMPLE, STUPID"

A message we get often from our less geeky customers. In the spirit of KISS we recommend these core grinds as the starting point for everyone. These broad-range structures provide a solid foundation to handle every condition, whether you have one pair of skis or twenty.

Each region experiences unique prevailing conditions. Skiers in the high Rockies will want to adjust toward the colder end of the menu, while skiers in the Northwest might consider heading toward the warmer end of the spectrum. We are always happy to consult with individuals or teams and can make recommendations to keep your life simple but ensure that you get the best of what we have to offer.

		1 pair	2 pair	3 pair
Classic	XTi2		★	★
	Li2	★		★
	Li3		★	★
Skate	CV0	★	★	★
	FS2		★	★
	3/3			★

WANT MORE INFO?

See BOULDERNORDIC.COM for full descriptions of these grinds and a comprehensive listing of available structures. We've broken it down into three tiers of information to keep it simple: basic, expanded, and painfully expansive. Check it out!

ating the bases. Most alpine shops know that they need to reduce pressure, but don't make a large enough adjustment. When a ski is ground with too much pressure, the base material is transformed to a mass of useless plastic – the sintered structure of the base material is obliterated, the surface is left quite rough and unable to absorb wax.

GRIND WATER – All grinding machines use water to cool and lubricate the base during grinding. The process generates quite a lot of friction, and the water heats up very quickly. When the water gets too warm, the base material melts instead of getting cut, smearing base material and sealing the base. Most shop grinders have no cooling system and the water temperature is seldom monitored during grinding.

STRUCTURE DESIGN – The structures used in alpine skiing are huge compared to those used in cross-country. Even a "fine" alpine grind is too heavy and coarse for a cross-country ski. Cross-country-specific grind patterns developed for European snow are out of place for racing use in North America because our climate and snow characteristics are quite different.



HOW TO GET IT DONE

YOU HAVE THREE OPTIONS TO GET YOUR SKIS TO US:

- Drop them off at one of our shops in Boulder, CO or Portland ME.
- Drop them off Nov 23–27, 2010 in West Yellowstone at the BNS Mobile Store.
- Ship them to us in Boulder, CO. Please DO NOT ship skis to Portland, ship them directly to our Boulder location!

SHIPPING SKIS

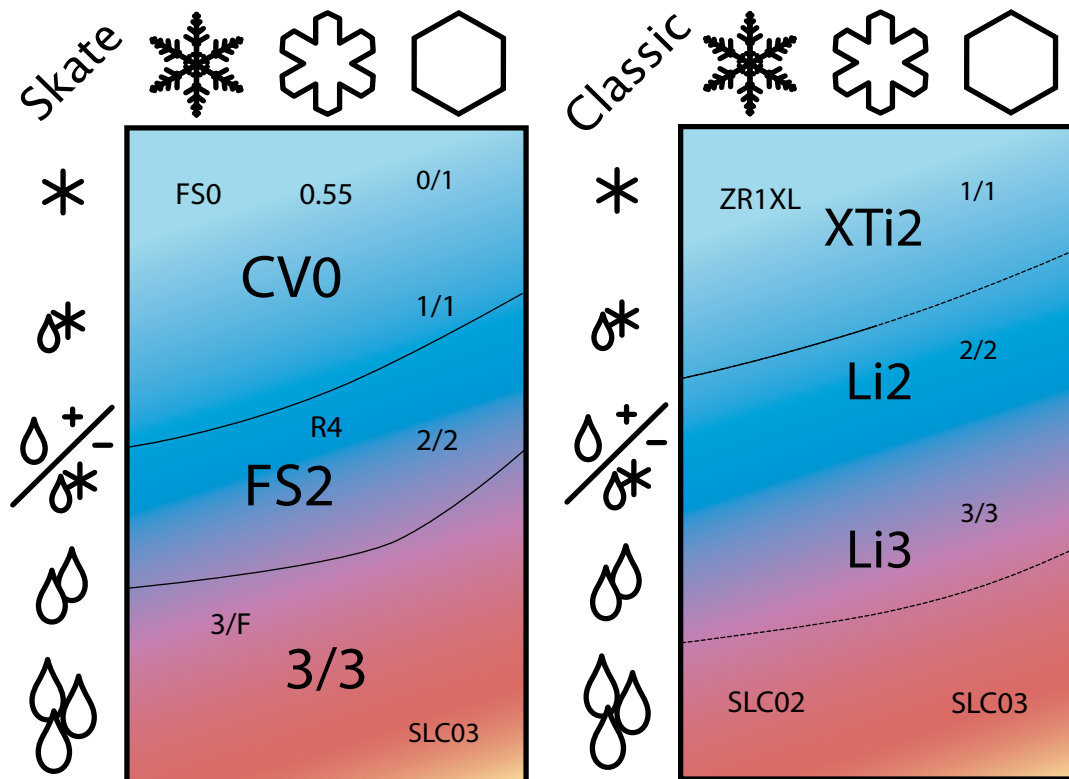
Download a stone grinding work order form from the "Ski Service" page at bouldernordic.com. There you will find our grind menu, info about the process, shipping addresses and instructions. Fill out the form, prepare your skis and ship them.

CALL US IF YOU NEED HELP

We can guide you to the right grind choice and answer other questions you might have. Find more information on our grinds and grind process at bouldernordic.com

EXPANDED RACING MENU

Give us an inch and we'll offer you 15 different structures. The reality is that snow conditions vary wildly, and we often need specific solutions to complement our broad-range core grinds. The grind development process is ongoing at BNS and we make it our business to keep you up to date. Read more at bouldernordicsport.com.



Read about the meaning of our snow crystal icons on page 10.



The middle section of the magazine is dedicated to Ski Service – waxing and base preparation once your skis leave our shop. This year we break down Ski Service by layer, with sections about Paraffins, Fluorocarbon Powders, Hand Structure, Optimizers, and Kick Wax. We discuss why each layer is important, how to apply the layer, how to best test & choose that layer for racing, and a graphic menu with some of our favorite waxes from each category.

WHY

WAXING THEORY: SCIENCE, OR SCIENCE FICTION?

For each of the layers that we cover we present some theoretical background under the “Why” heading because understanding the purpose of your work makes you a faster and more effective waxer. However, much of what we understand about the nature of ski service is scientifically untested. Relatively little of the science of fast skis is well-documented or broadly available and much of it is conjecture. The best summary we’ve heard was when a chemist for Swix told us that it was mostly “science fiction.”

Ski technicians rely heavily on empirical information. They test, and they use what works. Snow science has explanations for much of what we observe, but theoretical models are quickly overwhelmed by the multiplication of the many factors that we see on even the simplest and most stable race course. This is why test results frequently confound even the most experienced and scientific wax tech. We often are forced to accept “it works because it works.” In the following pages we present some of our “theories” and explanations for “why” based on our experience and our observations. These are meant as models to help understand each step, not delve into the theoretical analysis of snow science.

HOW

APPLICATION TECHNIQUES: THE GREATEST EFFECT WITH THE LEAST DAMAGE

Between stone grinding and waxing at our shops and performing race service, we worked on more than 4,000 pairs of skis last season. In the following pages we distill this experience into waxing guidelines to help you work more effectively and efficiently.

When working on this many skis, unfortunately we become very familiar with the types of damage that frequently cause skis to perform badly. While incidental scratches and dings incurred during normal use don’t slow your skis down much at all, the damage inflicted during waxing and preparation often causes skis to slow considerably. We’ve developed the tuning techniques in the “How” sections of the following pages in response to the common types of ski damage that we see—mostly burned bases or overheated ski cores. If you can follow the simple guidelines in these pages you can avoid the damage that afflicts many of your competitors’ skis.

MENUS

Each of the following layers features a menu of our favorite waxes. Snow crystal type is represented horizontally moving from new sharp crystals to old, dull transformed crystals, while moisture content moves vertically with wet, saturated snow at the bottom and dry, desiccated snow at the top.

SNOW CRYSTAL TYPE:

- New Sharp Crystals
- Old Fine Crystals
- Transformed Granular Crystals

Snow transformation is an endlessly varying process by which snow falls in some crystalline form, and then eventually ends up as either glacial ice or water. The intervening process can be instantaneous or take years. In general, snow starts out as well-defined crystals with sharp edges and a relatively high capacity to absorb and hold moisture. With time, the crystals dull and become less capable of soaking up moisture. Snow crystal characteristics are perhaps the most important variable in wax and grind selection. Our crystal type icons are intended to provide a basic indication of crystal types and our menus provide general guidelines for informed decisions.

SNOW MOISTURE CONTENT:

- Dry
- Moderate Moisture, still captured by the crystals
- Thawing snow, free moisture emerging
- Wet snow
- Fully saturated slop

Snow moisture content is often confused with relative humidity. Relative humidity is the capacity of the air to hold water vapor, and it can be misleading for choosing waxes. When thinking about moisture, it is best to consider the presence of free moisture in the snow and the movement of moisture through the snowpack. The moisture characteristics of the snowpack depend on crystal structure, temperature, air humidity, solar effect, and doubtless other factors. To help make decisions, it is best to develop a feel for the snow – touch it with your hands, make a snowball, squeeze it, observe the track surface and look for glazing. All of this will give you a good indication of the moisture level of the snow and how the snowpack is reacting to the moisture.

HEAT DAMAGE

Base material needs to be brought to a temperature near 110C in order to absorb wax, but the structural core of the ski will begin to deform when heated much above ~70C (158F). This means we have to heat up the base to absorb wax while keeping the core relatively much cooler. Wax should be applied with a hot iron so that it flows easily and is rapidly absorbed into the base. But it is important to work quickly so that the high-heat of the process doesn’t penetrate to the core of the ski or overheat the base.

We have expanded content online at bouldernordic.com, including pictures and video for each layer. Be sure to check out bouldernordic.com for these exciting additions and check back throughout the season as we build this library.



DECISION MAKING

STATEMENT OF PURPOSE

BNS has adopted the slogan "World Cup Service for Everyone," but we recognize that sometimes it might seem more like "let us complicate your life." The key to successful ski service is cutting through a seemingly overwhelming amount of information to get down to what factors really matter. We want to help you cut through the clutter and make sense of all the different variables that make fast skis so that you spend more time enjoying the rewards of good service and less time waxing and worrying. On the following pages we have provided some decision-making guidelines to focus your attention on the factors that matter the most.

ACKNOWLEDGE LIMITATIONS

The combinations of ski selection, stone grinds, waxes and structure modifications available on race day can be bewildering. Even at a major event like the Olympics, a service staff has to eliminate options and focus their testing on a small range of products. An individual racer arriving at a venue on the morning of the race and waxing alone is forced to work with many fewer options. Whatever your circumstances, you'll need to make assumptions and decisions about which products to use. You'll depend on weather forecasts and local knowledge of the course and conditions. You can never test and analyze every factor.

EFFICACY: PUTTING EFFORT WHERE IT PRODUCES THE BEST RESULTS

Due to the limited time and energy available to test on race day, it is smart to focus on the areas where your work produces the greatest returns.

Ski quality, ski selection and stone grind are the factors that contribute the most to performance on any given day. By race day, most of the fleet management work has been done and making the most of this work depends on your ability to pick the best skis available to you. Making the right ski selection may be simple work with a good fleet set-up, but it is still the first priority to ensure success on race day.

Once you select your race skis, you enter the realm of wax and optimization. In general, the greatest efficacy will result from a focus on the final layers—optimizers and hand structure.

TESTING

We make nearly constant reference to testing throughout this publication. Testing is how we gather information to support decisions and recommendations, and it is the basis of our expertise. There are two main types of testing that we conduct, and they serve very different purposes.

TESTING VARIABLES

This is where we identify one factor (paraffin, fluoro powder, hand structure, etc.) to test and try to control all other variables. For testing variables we work with matched test skis—skis that are selected (usually from the same production series) to have very similar characteristics. The skis are prepared in exactly the same way aside from the variable that we're testing. So, for example, in a paraffin test we will use a fleet of matched test skis with the same grind and base preparation, but with different paraffins applied. Testing can be conducted in several different ways.

Speed trap testing (using electric timing eyes to measure the time it takes to glide down a section of trail) provides hard data and we can apply statistical tests to show how much weight we should give speed trap results in our overall decision-making process.

Testing by feel is another method of evaluating a single variable. In our experience, the average skier can detect a significant difference on the order of about 0.3% between two variables just by skiing on the skis. It is often surprising to see how closely the results of a feel-test will correlate with the results of a speed trap test. Feel testing also provides the ability to evaluate the performance of the test variable at different speeds, climbing and descending, and at both half and full weight. If we have to choose between speed trap testing and feel testing, testing by feel wins because it provides more complete information.

Glide-out testing – where a skier lets the skis glide to a stop at the end of a downhill, and then compares how far they go using different skis – is a method that we don't use or recommend. The problem with glide-out testing is that it tends to focus on the performance of the skis at extremely low speed and half-weight, a situation that hopefully does not describe how you race.

TESTING RACE SOLUTIONS

We have emphasized the additive nature of the factors that contribute to ski performance, and at some point we need to test these factors in combination to see what they add up to. When we test more than one variable at a time it is impossible to draw conclusions about which specific variables are helping and which are not. We have to look at this process as an evaluation of the whole package.

This type of testing is most often used when it comes to selecting race skis. In this case the skis being tested are not matched test skis, and they'll often have different grinds on them. Racers frequently test their race skis with their race paraffin layer already applied, and so what is actually being tested is the unique combinations of skis, grind and wax.

Your skis have to take you all the way around the race course and deliver you to the finish in the shortest time possible. For this type of testing you need to keep in mind that the goal is high average speed. The methods used to test variables can be misleading when testing for average speed because they indicate specific strengths and weaknesses of a preparation, not necessarily the best overall solution.

When testing for average speed, you have to be sensitive to the balance of factors that help you get around the course and how much each factor influences the overall result. A simple example is testing and choosing kick wax, where there is always a trade-off between faster glide and better kick. Learning what combination of these factors is optimal for you is the key to choosing the right solution on race day. One useful test for average speed is to ski a loop several minutes long on different skis, timing repeated laps while holding effort steady. The results can be surprising and enlightening. 



ALWAYS MORE INFORMATION AT
BOULDERNORDICSPORT.COM

efficacy |'efikəse| *noun* the ability to produce a desired or intended result





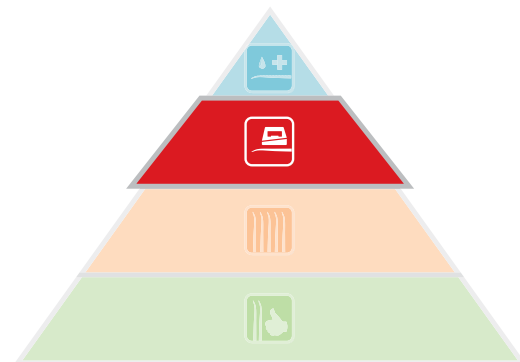
WHY

BASE BASICS

Most ski bases are made of P-Tex, an industrial thermoplastic with impressive qualities for a sliding surface: very low friction and high abrasion resistance. Racing bases are made by sintering, or pressing together small particles of polyethylene and additives under high pressure and heat. The sintering process creates zones in the base that absorb wax when applied to the base with adequate heat.

Most base formulations require an iron temperature of around 110 degrees Celcius to absorb wax. Alternatively, wax can be absorbed slowly over a longer period of time at a much lower temperature in a hot box, a glorified ski oven.

Physically, wax alters the hardness of the base surface, providing the ability to tune base hardness to the shape and aggressiveness of the snow crystals. Chemically, wax adjusts the water repellency of the base by modifying the surface tension and also lubricates the ski base, minimizing frictional forces. Additives in wax such as fluorine, graphite and molybdenum provide additional characteristics such as water repellency, dry lubrication and electrical conductivity.



HOW

IRONING TECHNIQUE

The biggest preventable threat to bases is poor treatment during waxing and tuning. The safest and most effective ironing technique is to use the iron temperature indicated by the wax manufacturer and to move the iron in a continuous pass from tip to tail without moving it back and forth on the ski. Two or three passes from tip to tail are sufficient for each wax application.

SCRAPING & BRUSHING

The purpose of scraping and brushing is to remove all wax from the surface of the base and leave it polished and work-hardened. Paraffin performs by modifying the characteristics of the base material and is not intended to provide the actual running surface. Scraping and brushing skis is a process much like sanding a table-top. Each step in the process should be done for as long as it provides results, and not longer. Scraping should remove almost all of the wax from the base, leaving practically nothing visible behind. In order for this to happen you need to use a very sharp scraper, capable of peeling even the hardest wax off the base rather than chipping it. A sharp plastic scraper will not damage the base unless you slip off the edge of the ski while pushing.

Brushing picks up where scraping leaves off. Brushing removes any wax residue left after scraping, cleans wax out of the structure (grind pattern) in the base, and polishes the base. For wax removal, we like a very fine steel brush with a bristle diameter under 0.1mm. A fine steel brush will work quickly to remove wax from the base and clean the structure without damaging the base material. The

softest paraffins will clog a fine steel brush, particularly if they're not well scraped. Sometimes we'll use a coarser steel brush for initial brushing of soft paraffins. Brushing with metal brushes should always be in one direction only, from tip to tail.

Polishing is the final step in the brushing process. We don't have firm evidence that it makes the skis significantly faster, but it sure makes them shiny, and a ski that looks fast tends to feel fast as well. Polishing is best done with a stiff nylon brush in a back and forth scrubbing motion using very high pressure.

BASE CARE

The surface of the ski base loses its pliability and capacity to absorb wax over time with exposure to the air. Keeping wax on your bases when you're not skiing will slow this process and extend the longevity of the base. Keeping wax in your base will ensure that the base doesn't dry out during skiing. This means maintaining sufficient levels of saturation (soft wax absorbed deeply in the base) and conditioning (a hardening layer near the surface to provide speed and durability).

MAINTENANCE

Wax that is absorbed into the base gradually comes out of the base while skiing, providing continuous lubrication. This also means that the skis need to be re-waxed regularly. It is a good idea to periodically clean, re-saturate, and condition the base. For cleaning we have increasingly been using the new fluoro base cleaners (not kick wax removers) available from most wax companies. These products

dissolve the top layer of wax in the base and allow pollutants to be brushed away with wax residue. A few strokes with the fine steel brush after the cleaner has dried will leave the base clean and ready for a new application of wax. Base cleaners are not astringent and don't harm the base or dry it out.

It also works well to use the warm-scrape method of scraping a soft paraffin directly after ironing, which effectively pulls out pollutants. However, we feel that this method deconditions the base more than the use of base cleaners.

[http://](http://bouldernordic.com)

Check out videos and detailed explanations at bouldernordic.com



SCRAPING TIPS

1. Start with one push of the scraper from tip to tail to remove the bulk of the wax.
2. Follow up with a few short, quick scrapes to remove pockets of wax missed in the initial scraping.
3. When scraping the edges and sidewalls, use the short ends of the scraper so you don't dull the scraping (long) edge.



1 - Clean the ski with base cleaner or by warm-scraping.



2 - Apply paraffin by laying a molten bead of wax onto the ski with the iron.



3 - Alternatively, heat the wax on the iron, then crayon it onto the ski.



4 - Iron the wax in two to three continuous passes from tip to tail.



5 - When the wax has cooled, scrape with a sharp scraper.



6 - Brush to remove excess wax with a soft metal brush and polish the base with a nylon brush.



DECISION MAKING

RACE DAY PARAFFIN DECISIONS

Race paraffin may occasionally be the real key to success, but it's rare. In most instances paraffins provide the appropriate level of hardness and additive content to support the powders and optimizers that will make the bigger difference. Time constraints on race day and the need to move on to testing subsequent layers mean that paraffin choice is necessarily a "ballpark" decision. Because paraffin testing offers relatively little benefit compared to the gains available from testing fluoro powders and optimizers, we don't recommend investing a great deal of time in it. Generally, the best strategy is to know a line of paraffin waxes well and combine your knowledge with test results from wax companies to find a paraffin setup that will do the job.

When you do have the time and resources available for paraffin testing, structure your testing to answer these questions:

1. What is the appropriate hardness for the wax?
2. What is the appropriate fluoro content for the wax?
3. What additives and underlayers are appropriate?

This information helps to bring the characteristics of the snowpack into focus and can provide the basis for better decision making on subsequent layers. It is best to test these variables one at a time, using one brand of wax to ensure that you are not adding too many variables to the tests.

It is always worth testing a graphite underlayer by running the same paraffin on two pairs of skis – one over graphite, and one alone. We often find that a hard graphite underlayer improves the speed of race paraffins, and it almost always improves durability and dirt resistance.

Sometimes – particularly in the case of graphite underlayers – the biggest advantage offered by a wax is its durability. When time is available it's always a good idea to get five or ten kilometers of skiing on your two or three fastest waxes after making a test, and then retest those waxes. When new information comes to light this way it is always extremely valuable. Fast skis are most valuable in the second half of a race.



WHAT TO USE

HOLMENKOL MATRIX LINE

Due to practical considerations, we often have to skip paraffin testing and get those layers on skis the night before a race. We love the Holmenkol Matrix line in these situations because of its simplicity and consistent excellence. No wax line will win every test, but Holmenkol Matrix waxes always test within striking distance of the best wax we can find. As a safe bet, you can't do better.

HOLMENKOL MATRIX BLUE

In Alaska, the Pacific Northwest, the Mid Atlantic and New York if it is below -6C and the humidity is above 50%, AND you don't have money or time to test, just put Matrix Blue on. You will always be in or at the top of the game without a doubt.

– Roger Knight

SKI*GO HF GREEN / C380

In extremely cold conditions in the dry mountain west I've had great luck with a layer of C380 over Ski*Go HF Green, ironing in the C380 much like I would a layer of fluoro powder.

– Eric Pepper

TIPS AND TRICKS

In fine and sharp snow crystals test a grade harder than indicated by temperature and humidity.

In coarse and dull snow crystals test a grade softer and higher fluoro content than indicated.

If you end up waxing softer than the indicated paraffin, use a harder underlayer prior to the final race paraffin. Ski*Go LF Graphite is always a great choice for this.

If conditions are abrasive or dirty test a moly/graphite paraffin like Holmenkol Matrix Black or Swix BW. If you don't have time to test, use the normal paraffin.

SKI*GO AND HOLMENKOL: GREAT PERFORMANCE, SUPERIOR VALUE.

	Small Block	Big Block
Swix HF	\$1.72/g (40g)	\$1.38/g (180g)
Toko HF	\$1.17/g (60g)	\$0.95/g (167g)
Ski*Go HF	\$1.40/g (50g)	\$0.88/g (200g)
Holmenkol Matrix Yel & Red	\$0.93/g (70g)	\$0.66/g (150g)
Holmenkol Matrix Blue	\$0.70/g (70g)	\$0.53/g (150g)
Holmenkol Matrix Green	\$0.56/g (70g)	\$0.46/g (150g)

PARAFFIN

SKI*GO LF Graphite
universal underlayer for all race paraffins in all conditions

HOLMENKOL Matrix Green	SKI*GO HF Green	Start HF80
HOLMENKOL Matrix Blue	HOLMENKOL Mtr Blue/Black	
Swix HF6		
SKI*GO HF Blue	SKI*GO HF Violet	
HOLMENKOL Mtr Red/Black		
HOLMENKOL Matrix Red	SKI*GO HF Yel/Vio	
Swix HF8	SKI*GO HF Yellow	
HOLMENKOL Matrix Red/GW25		

RACE HARDENING

Race skis are regularly subjected to high-heat wax applications in the form of high-melt-point paraffins or pure fluorocarbons. These applications will result in hardening of the base that is essentially the precursor to a "base burn." Base material begins to transform and harden at temperatures around 130C, but this initial transformation does not slow the base down, or affect its ability to absorb wax. Damaging burns occur over time from repeated overheating, particularly when the base is not all one density. The initial hardening of spots on the base isn't a big deal, but over time those spots retain more heat, begin to rise off the base, "grab" the iron with every pass, and become true burns.

To help avoid this we recommend a process of "race hardening" on all new or freshly ground skis. We use a high melt-point paraffin such as Swix CH4, Start Green or Ski*Go XC Green. With a high-quality iron set at 155C, the hard paraffin should be applied to the base in two continuous, moderately slow passes of the iron. The purpose is to use the wax to carry heat on the order of 130C into the top layer of the base, creating a uniformly hardened "shell" that provides superior speed without sacrificing the ability of the base to absorb wax. This shell also makes the base much more tolerant of the high iron temperatures that are regularly used in race preparation. We recommend race hardening skis after normal saturation and conditioning of the base. Race hardening is only necessary for skiers who will be applying high melt-point paraffins and pure fluoros.

CAUTION: This is an easy way to damage skis if done incorrectly. Check out the video of how to do this properly at bouldernordic.com.



Inconsistent line of hardened base material will grab the iron, burning the base and sealing it so it will not absorb wax.



Fresh base material on the bottom, race hardened base material on the top.



WHY

THE CHEMISTRY OF SPEED

Pure fluorocarbon waxes revolutionized ski racing because they repel water and lubricate far beyond what was possible with hydrocarbon (paraffin) waxes. Two of the most important factors that govern ski glide are water and dirt repellency. Pure fluorocarbons provide enhanced levels of performance on both counts when compared with traditional hydrocarbon waxes, providing superior glide and durability.

The advantage pure fluoros provide over paraffin waxes increases as conditions get wetter due to their amazing ability to repel water. This causes many racers to incorrectly assume that pure fluoros only offer a significant advantage in the wettest conditions. Advances in pure fluorocarbon technology have resulted in new compounds that work well in colder and drier conditions. They work so well that it's truly rare to race without pure fluoro powders at elite-level events. At a World Cup in Canmore we heard Larry Poroma, Oleg Ragilo and Peter Johansson (with a combined 40+ years of World Cup experience) try to remember the occasions on which they put skis in a race without using fluoro powders. They came up with only four or five examples.

In conditions well below freezing or in particularly cold and dry snow, pure fluorocarbons will often test slower than the best paraffins in initial testing. However, even when paraffins win initially, they tend to lose speed after several kilometers of skiing. After five to ten kilometers of skiing, pure fluoros usually overtake the best paraffins and start winning the tests. Also, cold applications of pure fluoros as optimizers (see page 18–19 for more on this) can often provide much better speed than paraffins or ironed-in pure fluoros.

HOW

IRON APPLICATION OF PURE FLUOROCARBONS

Powder should be sprinkled onto the base evenly. We usually sprinkle an even layer over the whole base, and then push any powder out of the groove with a fingernail or groove scraper. Powder can also be sprinkled in a line on either side of the groove. Once the powder is spread on the base it should be "tacked on" with a single relatively fast continuous pass of the iron, using the beveled leading edge of the iron to smooth the powder onto the base. We don't recommend tacking-on the powder by pressing it into the base with a stationary iron because base damage will result. Iron temperature is critical in fluoro applications since almost all pure fluoros require relatively high temperatures. If the iron is set at the low end of the temperature range it's likely that the fluorocarbon won't flow well under the iron and it will not bond completely to the base. If you are having difficulty with your fluoro application, try a hotter iron. Fluoro powder applications are much, much easier on flat bases in good condition.

ROTOCORK APPLICATION OF PURE FLUOROS

A roto-cork can be used for a hot application of pure fluoros, but it is slow, loud and messy. It is important to note that, while a roto-cork is somewhat less risky than an iron in terms of potential base damage, it is harder to make a good, consistent application.

Powder should be sprinkled and spread in the same manner as with an iron application. To "tack-on" the powder, run the roto-cork at low speed from the tail of the ski to the tip (rotation should always be from tip to tail). This will "pull" the powder under the cork, and prevent the cork from just pushing the powder off the ski. Once the powder is tacked-on to the base, the roto-cork should be run at high speed and moderate pressure. Sufficient heat will generally result in a lot of smoke, and the powder should "disappear" onto the base instead of leaving a waxy film.

GLOSSARY OF CHEMICAL TERMS

HYDROCARBON

An organic compound consisting entirely of hydrogen and carbon.

PARAFFIN

Used as a generic term for waxes with a hydrocarbon base. Fluorinated paraffins have some of the hydrogen attached to the carbon chain replaced with fluorine. We use "Paraffin" to refer to purely hydrocarbon wax, with no fluorine, or to fluorinated paraffins. Most wax companies have several levels of fluorination in their paraffin lines, typically CH (pure hydrocarbon, no fluorination), LF (low fluorination) and HF (high fluorination).

FLUOROCARBON

An organic compound consisting entirely of fluorine and carbon.

FLUORO APPLICATION: HOT VS COLD

Pure fluorocarbon products can be applied either hot or cold. A hot application is one utilizing an iron or roto-cork to bring the product to a temperature where it liquefies, flows, and then crystallizes or "sets," providing outstanding durability. Cold applications of fluoro—in block or powder form—can be made by hand corking or roto corking at low speed. This treatment does not offer the same durability as a hot application but it often offers superior speed. A cold application applied on top of a hot application can provide added speed benefits for at least 10K, and often longer. For more on optimization layers, see pages 18–19.

SCRAPING AND BRUSHING

There is a long-standing misconception that fluoro applications should only be brushed—not scraped—and that only dedicated fluoro brushes should be used. While there's no harm in only brushing—not scraping—and using dedicated brushes, it's usually unnecessary. Scrape the fluoro lightly with a plastic scraper and then brush and polish normally. For applications intended for cold and moderate conditions, we use the same brushes and process for fluoro powders that we use for paraffins. It is important to avoid brushes contaminated by residue from soft paraffins which may smear on the base and compromise the fluoro coating. To clean your brushes, work them against the side of the wax bench, blast with compressed air or use a vacuum cleaner.



1-Sprinkle an even layer of powder onto a clean, scraped and brushed ski.



2-Iron the powder onto the base using the bevel of the iron to spread and smooth the powder.



3-Once the ski has cooled, lightly scrape excess powder off the base.



4-Use a metal or horsehair brush to remove additional excess material from the base.



5-Polish with nylon by brushing with high pressure, back and forth.

WHAT TO USE

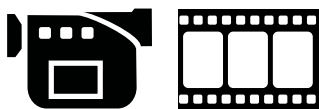
RULES OF THUMB FOR FLUORO POWDERS

In coarse granular snow, test warm fluoros, even at colder temperatures.

In old or transformed snow, test a liquid application instead of or in addition to powder.

In extremely wet glazing new snow, test a mid-range fluoro, even at warmer temperatures.

Visit bouldernordic.com for video and extended instructions on fluoro application!

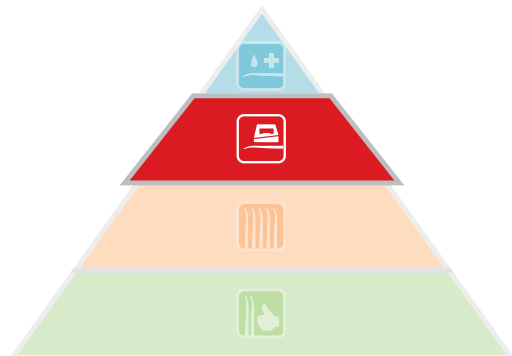


HIGH IRON TEMPERATURES

How much is too much?

The high recommended iron temperatures for most fluorocarbons make many skiers very nervous. After all, we've been warned about the dangers of burning bases. So how hot is too hot? Well, fluorocarbons are inherently hard on bases, and heat is part of the issue, but it's also part of the process. Almost all fluoros require iron temperatures that are hot enough to damage bases, so ironing technique is critical.

As with paraffins, it is important that the iron be set hot enough to allow the fluoro to flow easily, and allow the work to happen quickly. Bases can withstand higher heat more easily if they have been race-hardened (for more on race hardening, see page 13). Many of the newer fluoro powders – particularly the test products being used on the World Cup – require higher temperatures than ever, and it's common to see irons at 180C. While this is hard on the base, it does not ruin skis provided they are well maintained. With frequent cleaning, resaturation and conditioning, a race ski can take about a season of high-heat fluoro applications before requiring a regrind to expose fresh base material.



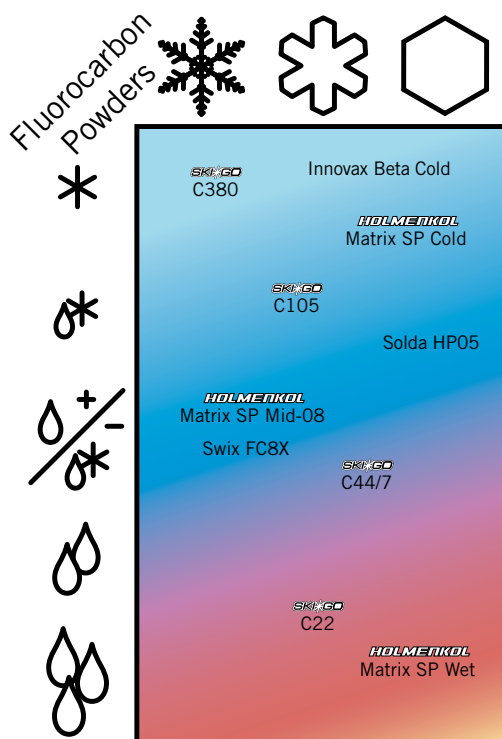
DECISION MAKING

The more we work with a variety of fluoro products and application techniques, the more we feel that fluoro powder applications represent another “foundation” layer, not necessarily a final layer. We increasingly take a “ballpark” approach to fluoro powders, much as we do with paraffins. When there is not enough time to test extensively we quickly choose a fluoro product that will be in the game and serve as a foundation for optimizers. We then focus our attention on optimizers, which can produce greater benefits.

When time and resources are available for fluoro powder testing we use much the same procedure that we use with paraffins. We consider it ideal to be able to test fluoro powders early on race morning, and make powder applications the day of the race. But if it is necessary to apply powder the night before in order to allow time for optimizer testing and application, that's acceptable and often the best solution if you are working alone.

For marathons and long races, optimizers provide an important advantage for the first part of the race. However, fluoro powders take on greater significance because they will determine the performance of the skis after roughly 30 kilometers when the optimizers have worn off. In these cases it is important to focus more testing on fluoro powders, and to make use of local knowledge and good forecasting to anticipate changing conditions during the race.

BNS



HOW MUCH IS ENOUGH POWDER?

Like paraffin, most of the fluoro powder applied to your skis will be removed prior to hitting the snow. The question of how much powder should be used has more to do with sufficient coverage than performance. It is important that the powder be bonded to the entire base, and effectively coat every surface of the structure of the base. Fluoro powder does not flow easily and will not spread well over the entire base without sufficient quantity. The less powder is used, the more heat and time is required to get good coverage, and the more base damage is likely to result. As a rule of thumb, assume five full applications of fluoro powder from a 30g vial. It is certainly possible to get more if you're careful. It's also common to burn more powder than that in the interest of working quickly and safely.



Fluorocarbon dust as it is being burned is toxic! Wear a respirator!



WHY

Hand structure physically modifies the base surface to optimize the interface between the ski and snow. Hand applied structure improves speed in most conditions by increasing aeration to break surface tension, managing surface-area contact and improving moisture-handling capabilities. Adding hand structure on race day, even to the best available grind, has surprising effect. It is uncommon to have a day when hand structure is not used on the World Cup.

HAND STRUCTURE VERSUS GRINDING

While both stone grinding and hand structure contribute to the final result, they each play unique roles. Stone grinding creates a textured surface by milling a permanent pattern into the base. Hand structure tools generally press patterns into the base, creating relatively narrow and low-volume interruptions of the base surface. Hand structure impressions tend to be relatively deep, with sharp edges and steep sides which can have a dramatic effect in spite of their low volume.

The nature of hand structure means that there are limitations to what it can provide for the performance of the ski, but there are certain performance factors that only hand structure can contribute. For this reason, both grinding and hand structure are used in combination for high level racing service in almost all conditions. Hand structure is best thought of as an optimizing process, much like fluoro block applications.

HOW

There are many different hand structure tools and methods available, so there's no simple and complete set of how-to instructions. The most important general instructions are to practice working with the tools, preferably on rock skis. Like all hand tools, hand structure tools require confidence and a sure hand. Many hand structure applications require quite a lot of pressure and some tools are capable of damaging bases.

Hand Structure tools leave relatively sharp impressions that can attract dirt, which slows down a ski. Hand structure should not be a chaotic and dense mess of displaced and sharp base material (typically resulting from a multitude of passes with various tools). This type of application is the most susceptible to pollution and will slow down in time. We have had success with layered structures using up to three different hand applications, but more than this appears to make the structure too busy to perform well.

All hand structure will partially or completely rebound out of the base over time and with the application of heat. Very heavy structures such as the large linear rills applied with a Swix Super Riller are more or less "permanent," as they will soften but never completely rebound. Most structure applied with rolling or tractor box tools will disappear almost entirely after four or five wax applications with an iron. Moderate hand structure can be applied many times before the original grind is compromised and regrounding is necessary.

WHAT TO USE

HAND STRUCTURE FOR EXTREMELY WET CONDITIONS

Extremely wet conditions require a lot of structure, but also tend to be challenging because water mobilizes all available dirt and deposits it on the base.

Hand structure can contribute to ski speed in very wet conditions in two distinct ways—it can provide turbulence to break up surface tension by creating smaller droplets, and it can provide drainage to help clear excess moisture. Interrupted structures provide turbulence, and strong linear structures provide drainage. A combination of interrupted structure and linear "drainage ditches" are usually a good bet. But in extremely dirty conditions it can be safer to use just linear structures which are less likely to pick up dirt. A classic stand-by hand structure modification for dirty, wet conditions is the Swix 2.0mm Super Riller with the 0.75mm Super Riller on top.

HAND STRUCTURE FOR COLD CONDITIONS

Recommendations for "no structure" or "as smooth a base as possible" are common in the coldest conditions. While it's important in cold conditions to have a smooth texture on the base, and a well hardened surface, we often find an advantage from added structure. In particular, we have good luck using the Holmenkol cross structure tool with one roller removed, or else the Finite Finish AF15. These tools create a fine linear imprint with fairly wide spacing (1.5 to 1.75mm) that crosses the base at a considerable angle. The angle prevents crystals from getting trapped in the structure, but provides aeration of the snow/ski interface. These structures are especially good on cold glazing snow.

Additional cold-weather options include the Finite Finish L02 and L04, or the Swix 0.25mm Super Riller. These provide a very high line frequency and appear to work well at organizing the interface between the base and snow in colder, high humidity, new snow conditions.

MODERATING EFFECT

Evaluating hand structure comes down to a question of weighing benefit against liability. A structure benefit in the warmer or sunnier sections of the course may be a liability in the colder sections. This liability is created by the sharp edges raised even by some of the milder rolling tools. Finite Finish has come up with a blank drum that allows you to detune your structure modifications. The blank can be used to balance the structure you need in wetter sections with the smooth texture required in colder, dryer sections.

LESS IS MORE?

Hand structures are quite sensitive to the pressure applied during application, and varying pressure during application can create a wide variety of results. A widely spaced structure tool presses on the base in fewer places, and so the pressure on each impression is greater, resulting in a deeper pattern. The increased depth and volume of each impression is what makes the structure more aggressive and better suited to wetter conditions. However, the same structure tool applied with very light pressure will not have the increased depth and volume, and will actually create fewer small impressions than a "finer" tool, resulting in less aggressive structure.



Applying hand structure.



View of structure going on the base.

1 – Prepare the ski by waxing. Typically this will involve base prep, paraffin layer(s) and possibly an ironed fluoro powder application.

2 – Brush and polish the ski well.

3 – Apply the hand structure by using firm, even pressure from tip to tail.

4 – Lightly brush with a fine steel brush.

5 – Apply a liquid or solid fluoro optimizer if desired.

6 – Polish with a nylon brush.

Visit bouldernordic.com for video and extended instructions on hand structure!



DECISION MAKING

The appropriate use of hand structure is as important as any other part of race-day preparation. The problem is that you can't layer hand structures on top of each other and use the same skis to test multiple treatments. Even though most hand structures will rebound out of the base after several waxings, they represent permanent modifications as far as race day is concerned. For this reason hand structure is an area where experience and decision making count. Our graphic menu contains our most successful and reliable hand structure treatments, and we're always available to consult on which tools to use and when to use them. Look for structure recommendations in the BNS wax reports from events across the country this winter.

Hand structure treatments are often very sensitive to changes in snow conditions as well as the slope and aspect of the trail. This commonly creates a situation where Structure A is better than Structure B on certain sections of the course and B beats A on other parts. Seek the optimal average benefit and avoid major liability at all cost. Be very cautious about selecting a hand structure that makes skis feel really bad anywhere on course, even if it feels really good in other places.

TESTING METHODS

Dedicated structure testing skis are a huge asset, but a luxury rarely available to anyone except high-level teams. With or without dedicated test skis, hand structure is accessible and worth pursuing.

FINDING THE RIGHT HAND STRUCTURE WITHOUT DEDICATED TEST SKIS:

It's possible to test two or three hand structure modifications on a back-up pair of race skis using these guidelines:

- Make a MILD hand structure modification on one ski. Leave the other ski unmodified.
- If the modified ski is better, then make another slightly more aggressive modification on the other ski.
- If more structure seems to be better, it may be worth making a new modification to the first ski and making one more test, but you're probably reaching the limit of what you can learn at this point.
- It's important to look and think ahead about temperature changes and solar effect as time passes through the day. When in doubt, use a less aggressive structure modification in order to limit the potential for liability.

FINDING THE RIGHT HAND STRUCTURE USING DEDICATED TEST SKIS:

It's very effective to test hand structures using the speed trap, but most people will find that testing for feel works well, and doubles the number of structures that can be tested since structures can be tested on individual skis. Test skis should be prepared with a relatively "cold" grind. In general, it is best to test hand structure modifications of the selected race grind, but this is a practical impossibility in most situations since the race grind is likely to vary from one race ski to another. Testing hand structure modifications on grinds other than those used on race skis isn't ideal, but it's still effective and seldom leads to the wrong conclusion. 

OUR FAVORITE STRUCTURE TOOLS

HOLMENKOL CROSS STRUCTURE TOOL \$120

The Cross Structure Tool has two rolling structure drums with opposing threads at 1.75mm spacing. Each drum creates a linear structure that crosses the ski base. With both drums in place, the opposing angles create a fishnet pattern which is very effective at breaking surface tension in high-moisture glazing conditions. With one drum removed, the offset linear structure provides fantastic performance in cold and dry glazing conditions, with very little liability in areas where the snow is not glazing. This is the tool that taught us the extremely high value of hand structuring in cold conditions.

SWIX SUPER RILLER \$50

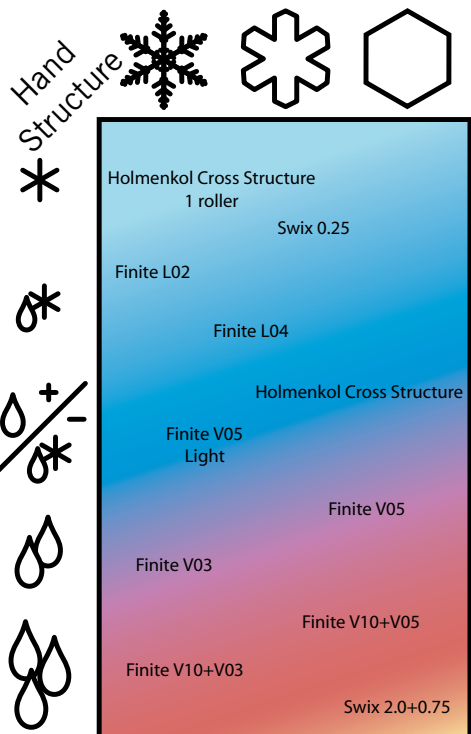
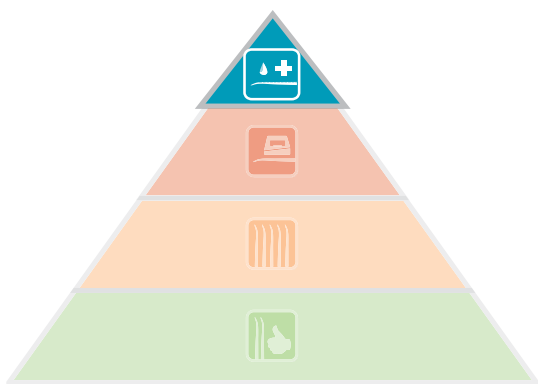
The Swix Super Riller is the original structure tool, and remains indispensable. It creates relatively sharp linear structures that provide good moisture clearance in wet conditions and effective crystal management in dry conditions. Interchangeable structure blades are available with line spacing from 0.25mm to 3.0mm. We find that the smaller structures pressed into the ski very lightly, work well in fine-grained, glazing snow, while the 0.5 to 1.0mm blades handle moist snow under freezing well with the 1.0, 2.0mm and 3.0mm blades working well for saturated snow. It is common to use the 2.0mm covered by the 1.0mm or 0.75mm rill in sloppy wet conditions.

FINITE FINISH STRUCTURE TOOL (\$499 as a kit with 5 drums)

Eric and Joe Jensen, the developers of the Finite Finish Structure Tool, are avid ski racers and top level masters based out of Boise Idaho. When they're not ski racing or training, they run AceCo Precision Manufacturing in Boise. AceCo has five divisions, and the ski tools are essentially a hobby. But they're a hobby executed to the exacting standards that has made AceCo an industry leader in tool production and semiconductors. You won't find another ski tool anywhere that matches the quality of design and workmanship of the Finite Finish.

The Finite Finish Tool is designed to work with a large variety of interchangeable structure drums and cutters. It is a "tractor box" type tool; a geared drive-wheel rotates the structure drum opposite the direction of travel along the ski base. This means that the drum creates a smooth and relatively high-volume impression compared with normal rolling tools. The Finite Finish platform can also support normal rolling drums (without gears, they just roll along the base) and non-rotational cutters. We have been testing a large variety of additional drums, and have worked with the Jensens on future development. At the Olympics we used several combinations of the standard drums to very good effect, winning several hand structure tests when we were testing every structure tool available. There are currently six structure drums and one "blanking" drum (used to de-tune and smooth structure) available. We expect more to be available in early winter.

The Finite Finish Tool is the platform that we at BNS have invested in for our own testing and development. We will continue to be partners with AceCo in the development of new structure solutions, and we will be testing and recommending Finite Finish structures as part of our race-service work. The Finite Finish platform is the most advanced and flexible structure solution available, and will grow to support your ongoing needs.





WHY

THE BEST BANG FOR YOUR BUCK

Fluorocarbon optimizers (hand-corked liquids and blocks) have produced the most stunning advantages we've ever seen on race day. Often the performance gained from adding an optimizer layer to a powder application exceeds the performance gained by the powder over paraffin. Relative to fluoro powders, fluoro blocks and liquids are relatively inexpensive, and the cost per application is comparatively low. Additionally, application is quick and easy.

OPTIMIZING SPEED

While hot (ironed) applications of pure fluorocarbon powders improve speed over paraffin waxes, their outstanding durability and stability are their greatest assets. In general, additional work is required to find optimal speed for high level racing, and this is where cold (hand-corked) applications of fluoro compounds come into play. All fluoro products can be applied either hot or cold, and when we refer to optimizers we're generally referring to cold applications. It should be noted that powders can be used as optimizers with cold application, and that fluoroblocks can be used as foundation layers with a hot application (most often using a roto-cork). It's perfectly sound practice to use the same product for both hot and cold applications.

Cold applications of fluoro compounds provide superior speed for several different reasons. The high heat of an iron or roto-cork application causes the compound to bind to the base at random angles with respect to the direction of travel. The particles that are pointed "against the grain" will push against snow crystals, increasing friction. The hot application also chemically modifies the fluoro compound, reducing its water repellency and lubrication. By contrast, a cold application remains chemically pure and pliable. It can be directionally oriented on the ski to reduce friction by brushing (we use fine steel), and it retains all of the glide properties of the pure, unmodified fluoro compound. The moderate heat and pressure of hand-corking help the compound flow, providing comprehensive coverage of the base surface which also improves speed.

We categorize liquid fluoros as optimizers along with cold applications of fluoroblock or powder. While we generally prefer to use an ironed powder foundation to guarantee durability, occasionally the performance of liquids is better without a powder application underneath. When used alone, most liquids maintain durability for a 10 kilometer race. Liquids tend to excel in older granular snow, and when they are the right solution they can provide a glassy, almost frictionless feeling interface with the snow. 

HOW

The layer of fluoro applied in a cold process can be quite thin since the cold application poses no risk to the ski base and the product can be worked liberally to ensure good coverage. Fluoro compounds are applied by crayoning the block on until a thin layer uniformly covers the base. Many fluoroblocks are prone to crumbling. When this happens it is best to "capture" the crumbs or small chunks with a hand cork and spread them out using the cork. For cold application of powder it's not necessary to use as much powder as would be used for a hot application. Simply sprinkle a small amount of powder on to the base, and then spread it with the cork.

Although we refer to powder or block fluoro optimizer layers as "cold" applications, a fair amount of heat is required to spread and bond the fluoro compound. We favor hand corking over roto corking because it's not difficult to generate enough heat, and impossible to generate too much. Natural cork creates more heat than synthetic cork, and the large-sized Ski*Go natural corks that we use for dedicated fluoro application make fast work. Once the fluoro compound is spread evenly on the base, cork aggressively in both directions using high pressure.

Cold applications with the roto cork are also possible. They may not save a lot of time, but they will help to save your shoulders and arms if you've got to do a lot of skis. To

ensure that the appropriate level of heat is generated, you should use low rotational speed. On a cordless drill use the lower speed setting. A high speed corded drill may be difficult to control at low speed. Rotational speed should be kept to 300–400RPM and below.

Once corking is done it's best to set the ski aside for two to five minutes to allow the surface to cool and the compound to harden. Once cooled, gently brush with fine steel for 20–30 seconds. A very fine steel brush with fairly long bristles won't "brush away" the fluoro coating. Brushing appears to be an important step in organizing the structure of the fluoro compound. After brushing with steel, polish with hard nylon. 

TRICKS FOR EXTREMELY WET CONDITIONS

In saturated slushy conditions, we have found that applying multiple layers of fluoro block with a special application helps manage dirt and moisture. Cork the first two or three layers as normal, and instead of brushing the base clean, use a stiff nylon brush to "brush in" the wax so that it leaves a film on the ski. After two or three corked applications, you can skip corking, and just use the nylon brush to brush the wax into the base. The result is a somewhat filmy and dull-looking but very water-repellent finish which sheds dirt as the fluoro film comes off the ski. This provides superior speed for two or three kilometers, and is very effective in sprint competitions.

TRICKS FOR EXTREMELY COLD CONDITIONS

In extreme cold, a fluoroblock finish can be hardened with an iron. After the fluoroblock has been applied and brushed as normal, use a very hot iron with a piece of fiberlene over the base plate to "burn-off" some of the fluoro. This will harden the surface and can gain speed in extreme cold. This step should always be tested against a normal fluoroblock application.

1 – Apply the liquid or block to the ski. For blocks, crayon on the ski, for liquids, paint a smooth layer on the base and let it dry. Ideally, 20 minutes.

2 – Cork with a Hand-Cork (cold application). Push hard. The liquid/solid fluoro will get gooey as it heats up and will then become clear as it is absorbed into the base.

3 – Let the Ski Cool for five minutes plus.

4 – Brush with a metal brush lightly, going tip to tail direction only.

5 – Polish with a nylon brush going back and forth at high speed and pressure.

Applying Fluoro Optimizers: Quick and Easy



Applying solid fluoro block



Applying liquid fluoro



Corking



Brushing



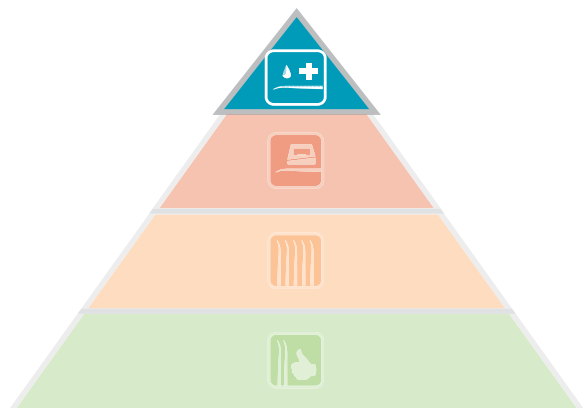
WHAT TO USE

DECISION MAKING

Fluoro optimizers are generally quick to apply and easy to test. Testing is generally conducted by “feel,” and it’s possible to test many different optimizers in a short period of time by continually applying a new product on top of the “losing” ski and refreshing the application of the “winning” ski.

One waxer and one test pilot in combination can test a lot of fluoro block and liquid applications very quickly. The mechanics are simple – with three or four individual test skis in rotation, the waxer ensures that there is always something new for the test pilot to try against the current winning wax. The differences between optimizers are often much larger than one might expect, and it doesn’t usually take long to find the winner. When the differences feel minimal, then there probably aren’t big differences! We have tested up to fifteen different optimizers on race day using this method.

If you’re working alone, without matched test skis and a dedicated test pilot, you can still be very effective testing and choosing optimizers. With a single pair of skis (warm-up skis – or whichever pair of race skis didn’t make the cut), you can relatively quickly run through four or five different optimizer options in short order, leaving time to apply the winner on your race skis.



SKI*GO C22 BLOCK

I’ve used this in conditions where it should never work, such as 2009 US National Championships in Alaska at -20C and colder and also at +5C and completely saturated snow. If there is a more versatile wax in the world, I don’t know it. Its range is exceptional because it is the hardest warm weather wax going which makes it perform well outside its recommended range.

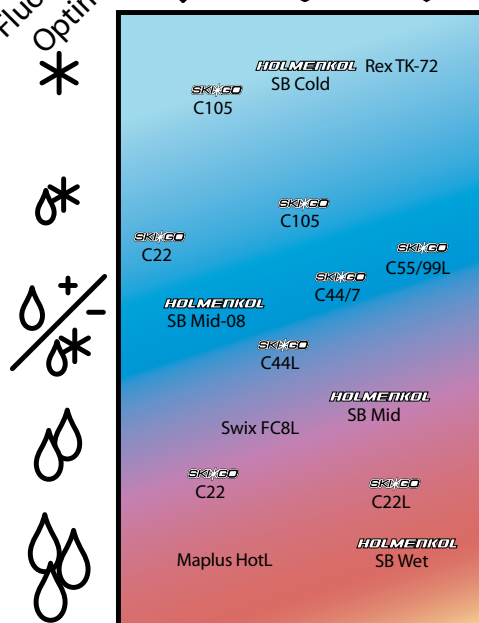
–Roger Knight



SKI*GO NATURAL CORK BIG

A BNS Favorite! This large natural cork is great for corking fluoros of all types. Does the job in half the time of other natural corks. 68151 \$7

Fluorocarbon
Optimizers



I was waxing for DU at the NCAA championships and it was the last day, so I had been testing for days and had the paraffin and powder down to a few choices. I ran those through the speed trap quickly to verify and then began working on testing 5 different blocks. I threw one liquid in the mix just to see if liquids were working. When I stepped on that pair of liquid skis to run it through the speed trap I laughed out loud they were so good. I ran it through the speed trap once just to verify and it destroyed everything else I had been testing. I abandoned my test skis on the track and ran back to the wax cabin where I had two pairs of test skis available. Within 10 minutes I had tested six different liquids and found something that was even better than the first one. We had incredibly fast skis that day.

–Nathan Schultz

WHY

It still astounds us that the miraculous combination of perfect grip and fantastic glide is possible on the same pair of skis. Kick waxing at the highest levels is an art and could easily be the subject of a (long) book. The many variables involved in both products and application create complexity that often overwhelms skiers new to kick waxing. The fundamentals of kick waxing are simple, however, and success in kick waxing can be easily achieved by applying a basic understanding of how kick wax works.

Kick wax grips the snowpack mechanically by physically engaging the snow crystals and forming weak chemical bonds with the snow. When the kick is completed, the kick wax should release the snow crystals as the ski rebounds up off of the snow. Additionally, it is important for the kick wax to repel water and dirt as much as possible. It is asking a lot for one material to successfully handle all of these factors.

HOW

The ideal kick wax application matches the hardness of the snowpack: soft enough to engage the snow and provide grip, but hard enough to release the crystals, repel dirt and not grip the snow when gliding. This is accomplished by finding the appropriate grip waxes, layering and sometimes mixing them to achieve the best balance of grip and glide possible. The goal is to get an appropriate thickness of the right wax distributed on the right part of the ski. Hardwax is applied by crayoning and then hand corking smooth. Typically hard waxes are applied in a series of thin layers in order to best control the thickness and keep the application smooth. Klister tends to be applied in single layers by dabbing them on straight out of the tube. The klister is heated using an iron, heat gun or torch and then smoothed out on the base using the iron or fingers.

BINDERS

All grip wax applications begin with a binder layer of a relatively harder wax that binds to the base and provides a platform for subsequent layers to bind. Typically, a binder is either a green or blue hard wax, a dedicated binder hard wax or a hard klister that is used specifically to provide durability to the top layers. Binder choice can dramatically affect the speed of the wax job, so it's a good idea to test some different base layers to find the best balance between durability and speed.

The binder is applied in a thin layer and bonded to the base with heat. After ironing or heating the binder layer to the base, allow it to cool. Smooth the binder with a cork and then proceed to applying the top layers.

LAYERING & MIXING

Many wax jobs involve layering waxes of different hardness. This usually involves putting a harder (and faster) wax on top of a softer, cushioning layer in an effort to improve the speed of a solid-kicking wax that alone is slow or icing. It's also common to cover klister with a layer of hard wax for transformed, granular conditions.

Layered wax jobs provide unique advantages since the layers retain some of their independent qualities, while mixed waxes just form a new homogenous layer with its own qualities. Layering waxes can be tricky because too much pressure applied in corking will cause the layers to mix. To create layers, make sure that the base layer is well cooled and hardened, apply the cover layer with light pressure, and cork lightly.



WHAT ABOUT WAXLESS?

Waxless skis have been around for decades, and have gotten pretty good. But while they may have achieved universality for touring function, they haven't replaced wax in the racing world except in a small range of conditions. Waxless skis come in two varieties, pattern skis (or "fishscales"), and "hairies."

Pattern skis are, by their nature, quite slow since they necessarily involve a very rough surface. They can be effective as a race solution in a narrow range of wet, fine snow conditions, or when conditions are too varied or changing too quickly for any other solution to be viable.

Hairies are a base preparation technique that involves abrading the kick zone of the ski to create small hairs which provide tremendous grip in the right conditions. In recent years the understanding of exactly when hairies work has broadened significantly, and the preparation technique – supported by dedicated "zero" skis from every major ski manufacturer – has become increasingly prevalent in racing. Hairies work well in falling snow near and above freezing, a range of conditions where good wax solutions are at best difficult, and at worst impossible. But hairies are effective in warmer and wetter conditions as well, providing the possibility of good kick and glide nearly any time there is free-moisture collecting at the surface of the tracks.



Sand the kick zone using 150 grit paper wrapped around a cork or sanding block. Sand the kick zone lengthwise.

Apply binder by crayoning the wax, then iron and cork the binder layer smooth.



Apply hardwax by crayoning light layers. Cork between layers.

Apply klister by dabbing onto the base. Heat with an iron, torch or heatgun. Smooth by hand.



DECISION MAKING

GENERAL INFORMATION

Decision making for kick wax is as much about procedure and application as it is about identifying the right wax. It's always necessary to get in the ballpark by testing a number of different waxes on test or warm-up skis. But once the basic parameters are nailed down, you need to use your understanding of how and why the wax is working to modify and refine the application on race skis. Refining the performance of race skis is more important than chasing a slightly better wax. Every time you make an application you should know what your adjustment will be, whether the need is for better speed or better kick (or both).

The challenge of waxing for a team is lessened greatly if the waxers know the skis well in advance. It's a really good idea to have a standardized method of marking kick zones for the entire team so that the waxers know what they're looking at when they put a ski on the bench.

Racers will almost always need an adjustment to their skis prior to the race start. The race-day timeline should provide a chance for athletes to test their skis with plenty of opportunity for adjustment before the start. Even when conditions are changing quickly, it's more important to give the athletes an opportunity to test their skis than it is to have the perfect, up-to-the-minute wax job.

While it can get a little messy on klister days, it's not a big deal to scrap a wax job and start over on race skis. If the foundation of a wax job isn't right, then trying to adjust it is probably futile. In these cases it's better to start over with better information. If this has to happen on race skis it's not a disaster. Scrape the wax from the ends of the zone toward the middle. Don't worry about solvents – just make sure there is sufficient binder on the ski and start over with waxing. You can always rebrush and apply fluoro optimizers on the glide zones to ensure that they're clean and fast.



TESTING KICKWAX

It is usually necessary for kickwax to be skied-in for at least several hundred meters before its performance is optimized. It is common for both kick and glide to improve with a little bit of skiing, and no decisions should be made until the skis have been on the snow for close to one kilometer.

Part of testing kick wax involves testing the course. It is important to pay attention to both traffic and course conditions when wax and skis are being evaluated. Often the tracks near the waxing area are very heavily skied, while the rest of the race course sees much less traffic. It is important to evaluate and anticipate the way the wax will work on different sections of the course.

Testing wax is not the same thing as testing wax-jobs. It is important to get wax on race skis early enough to evaluate and adjust their performance.

THE RIGHT WAX, THE RIGHT SKIS,
THE RIGHT APPLICATION

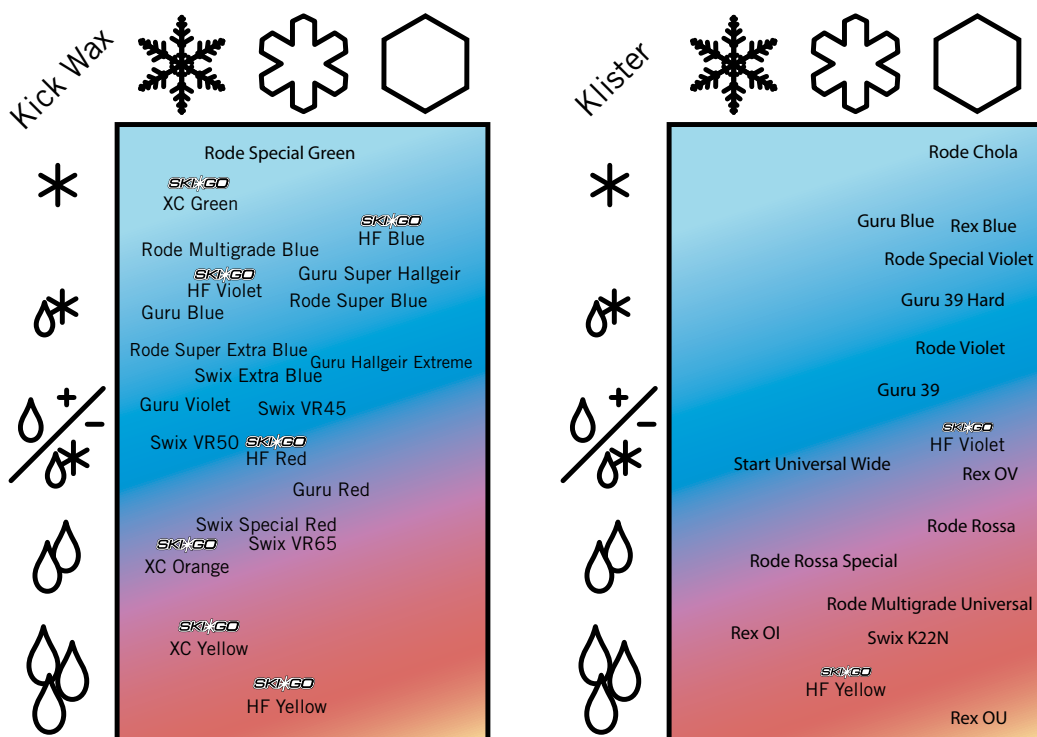
Kick wax application is at least as important as wax selection. Thicker and longer applications generally give better kick, but they may sacrifice a great deal of speed. Understanding the way the skis work is critical for getting the right wax in the right place. You should have a good understanding of the length, position and shape of your wax pocket, the action of the pocket (or how the various parts of the pocket move), and which parts are critical for providing kick. Learning your skis and the differences between different pairs will make you a better waxer. The best teacher is experience, and it's a good idea to train on race skis, particularly when conditions are tricky. "Making-do" on a training day can teach you the lessons required so that you don't need to "make-do" on a race day.

GETTING WAX TO STICK TO A COLD BASE

Kick-waxing is often done outside in cold conditions. Under these circumstances it can be difficult to get the wax to stick to the clean base. The temptation is to warm up the wax so that it will stick more easily. This results in warm, pliable gobs of wax sticking to the cold base in big clumps which are very difficult to smooth out. Instead, try warming the base. Aggressive corking of the dry base warms the base enough to allow the wax to adhere in a thin, even layer. Once the first layer is on, subsequent layers go on easily. This technique also works for applying additional layers to a wax job that has already been skied and is cold and wet from the snow. Corking the existing wax job dries and smooths the surface, preparing it for additional layers.

The opposite approach is necessary when layering a hard (cold) wax on top of a softer wax. In this case the soft wax will simply be prone to smearing if it is warmed up. To successfully layer a hard wax on top of a softer wax, ensure that the soft wax is well-cooled on the base, and then warm the cover-wax with a torch or heatgun. Apply the cover with extremely light pressure, and cork lightly so that only the surface is heated and smoothed.

WHAT TO USE



KICK WAXING TIPS

As a rule, even the best skiers in the world need race skis that are really easy to kick. Always start by nailing down kick, and then find ways to improve speed.

It is very often necessary to wax a grade or two warmer than temperature indicates. Don't feel bad. Just get the kick.

In glazing tracks, try a softer wax applied thinner – a thick layer of wax guarantees slow skis in glaze.

In granular snow, try a thicker application of a cold wax.

In cold new snow, try covering your wax job with a thin layer of something very fast once you have made good kick. Speed is nice to have.

Visit bouldernordic.com for video and extended instructions on kick wax application!



CUSTOM WAX CONSULTATIONS

Want to trick out your wax box with help from pros who can guide you on how best to use your limited wax budget? Commit to a custom wax kit of \$500 or more and we will consult with you to build the ideal setup for you based on your location, existing kit, and what kind of racing you do.



KITS

Take advantage of BNS's Ski Service expertise and find the best waxes to have in your wax box based on what wins tests. We've compiled the top waxes we use in our wax service work from the World Cup and North American races and placed them in charts on pages 12-21. Additionally, we offer several pre-made kits using some key elements of Ski*Go's and Holmenkol's lines. We had a lot of interest in these package deals last year so we are keeping these four primary kits in place. We realize that budgets, regional needs and existing wax kits vary, so we have added custom consultations as well as extra options for kits on the web. Go to bouldernordic.com to see all of the kits we've put together, customize your own kit, as well as to find detailed information on the nine brands of wax we sell.

WAX QUESTIONS? WAX BOX CUSTOMIZATION? CALL BNS!

Consult with BNS experts to build the ideal setup for you based on your location, existing kit, and what kind of racing you do. Custom Kit discounts are 10% when you spend \$500, 15% on \$1000 and 20% on \$1500 or more. Custom Kit discounts cannot be combined with any other offers, discounts or team pricing.

HOLMENKOL MATRIX STARTER KIT

Holmenkol Matrix Yellow, Red, Blue, Green 70g each
Kit Price: \$150 **Retail: \$218 Save: \$68 (31%)**



SKI*GO FLUORO POWDER KIT

Ski*Go C380, C105, C44, C22
Kit Price: \$330 **Retail: \$417 Save: \$87 (21%)**



HOLMENKOL FLUORO STARTER KIT

Holmenkol SpeedPowder Mid & Wet
Holmenkol Speedblock Mid & Wet
Kit Price: \$320 **Retail: \$440 Save: \$120 (27%)**



SKI*GO OPTIMIZER KIT

Blocks: C105, C44 Liquids: C44, C22
Kit Price: \$360 **Retail: \$448 Save: \$88 (20%)**



TOOLS

At BNS, we spend a lot of time standing in front of wax benches, stone grinders, and out on the trails. In the course of our work as professional service people, we discover the tools that make our work a delight. Here are some of our favorites. This year we have taken our favorite tools and combined them into a comprehensive kit and of course added a discount to the price.

BNS TOOL KIT - OUR FAVORITES

Kit Price: \$320 Retail Price: \$400 **Save \$80 (20%)**

Holmenkol Digital Waxing Iron
Holmenkol 5mm Scraper
Holmenkol Groove Scraper
Ski*Go Nylon Brush
Ski*Go Long Fine Steel Brush
Ski*Go Natural Cork Big - Fluoro



Be sure to check out the individual magazine spreads on Holmenkol and Ski*Go for a look at additional tools. Also, bouldernordic.com has a comprehensive listing of tools from Holmenkol, Ski*Go, Swix, and Toko along with a library of information and videos demonstrating wax application, ski prep, stone grinding and more.



The Cross-Country Company
Since 1906

For over 100 years, the Madshus M has been the hallmark of Nordic craftsmanship. In the early days, Madshus ski craftsmen purchased their wood as standing trees. Each craftsman carefully inspected each tree, plotting potential cuts and training their keen eyes on the tree's grain. Only those trees that met their strict criteria would have their fates sealed with a Madshus axe, emblazoned with the steel M. This same attention to detail lives on in Madshus' finely-tuned production processes of today, continuing to craft some of the world's finest quality skis, as they have for over 100 years.

Madshus Champion Series

Skis Made By Hand, A Legend Built From Gold



Madshus' New Champion Series Nanosonic Race Skis are testament to the uncompromising craftsmanship and tireless innovation of the World's oldest ski manufacturer. Madshus engineers, in cooperation with their stable of World Cup athletes, committed themselves to developing the fastest, most-lively, and responsive line of race skis on the circuit. The skis' low profile 3D tips provide substantially reduced swingweight and their precision milled Rohacell® cores, the same as found in high performance helicopter rotors, create the most consistent and responsive performance ski the world has ever seen.

Madshus' "FeelGoodBoots"



Four years after the launch of the Madshus boots on to the World Cup circuit, Madshus engineers working with Team Madshus athletes continue to drive innovation in boot development. Working with innovative Membrain® softshell and hybrid constructions, Madshus has removed all PVC from their entire 2010-2011 boot line. By redesigning their boots without PVC, Madshus is lessening its impact on the winter world around us, while providing unrivaled fit and feel. Not only do Madshus boots feel great, but you can also feel great about wearing them.

Visit www.madshus.com for more information.

NEW FOR 2010-2011

We were not planning to become the US Holmenkol distributor last June, but when we found out the opportunity was available, we jumped at the chance. We had great success with Holmenkol waxes in our race service work, the blue Holmenkol tools had found their way into each of our personal wax kits, pricing was dramatically lower than the competing brands and the wax system is simple to understand and use. We figured that Holmenkol would sell itself if we could just spread our enthusiasm for it around a bit.

It turns out that we were right. Holmenkol has a lot to offer and thousands of skiers across the country discovered exactly that last season. We spent a lot of time on the phone coaching people through the Holmenkol line and what to use when. We were rewarded with some ecstatic Monday morning calls back to report the results.

In addition to supporting Holmenkol here at home, we also had the opportunity to work with the Holmenkol Race Service Team at the Olympics which led to testing new products for the R&D department in the spring in Colorado and at our New Zealand camp this July. This partnership allows us to help guide the development of wax and tools forward. This is especially important given the traditional euro-centric development path that most of these companies have. We have the opportunity to provide feedback that will actually be heard with respect to the unique snow conditions we find here in North America.

Having seen some of the test products and ideas the R&D chemists are pursuing, I'm excited that Holmenkol will continue to push the limits and come up with improvements to their already-great products. Holmenkol's research team is leveraging Holmenkol's existing technological advantages in new ways while they also pursue completely new ideas. I'm confident that they will continue to create industry-leading products and I'm already looking forward to trying out the next batch of test wax.

Here is the lowdown on what's new and in development for 2010-2011:

Mid and Wet Powders have a new additive to increase durability, dirt repellency and speed.

Cold 59 race service powder will no longer be produced. Our supply is expected to run out late in the 2010-2011 season. Holmenkol recommends Hybrid Cold Powder (alpine) as a substitute for the die-hard Cold 59 fans.

Natural Wax – made from renewable materials and 100% biodegradable, Holmenkol Natural wax is an excellent way to have fast skis while being environmentally conscious. We tested this wax last year and found it to be durable and fast. Comes in fluid, stick or iron-in bar formats.

Look for some new tools and waxes to be released at the end of January.

SKI*GO AND HOLMENKOL: GREAT PERFORMANCE, SUPERIOR VALUE.

	Small Block	Big Block
Swix HF	\$1.72/g (40g)	\$1.38/g (180g)
Toko HF	\$1.17/g (60g)	\$0.95/g (167g)
Ski*Go HF	\$1.40/g (50g)	\$0.88/g (200g)
Holmenkol Matrix Yellow & Red	\$0.93/g (70g)	\$0.66/g (150g)
Holmenkol Matrix Blue	\$0.70/g (70g)	\$0.53/g (150g)
Holmenkol Matrix Green	\$0.56/g (70g)	\$0.46/g (150g)



SPEEDPOWDER AND SPEEDBLOCK PURE FLUORO

Holmenkol uses a patented nano-CFC formula that combines the excellent properties of conventional fluorocarbon powders with the physical surface effects of nano composites. The result is a first class coating for your ski base which sets new standards in terms of speed, abrasion resistance, range of applications, and ease of use. Blocks use the same raw material without the nano coating. These waxes enjoyed a breakout year in the US in the winter of 2010, with unparalleled success at all levels. These waxes also use a very simple to understand system, not fancy code names: just Cold, Mid, and Wet.

Cold Excellent cold fluoro for a wide variety of snow types and conditions. BNS has found this to always be one of the best cold fluoros on the market on days below -6C (21F). Iron temp of 155C-165C or cork by hand.
Matrix SpeedPowder Cold \$125 Matrix SpeedBlock Cold \$95

Mid In the mid-range this is a must have, as it always is near the top of our tests. Mid excels in the -9C to -1C (15F-30F) range in all snow types, especially old snow. Iron temp of 150C-160C. New formulation for 2010-2011.
Matrix SpeedPowder Mid \$125 Matrix SpeedBlock Mid \$95

Wet This powder is good in warming conditions from -4C (25F) on up. Very good in the not-quite-saturated snow but with significant moisture present which makes it unique among wet powders. Speedpowder Wet can go lower than its published range and it is worth testing this powder against mid-range powders as it will often outperform them. Iron temp of 150C-160C. New formulation for 2010-2011.
Matrix SpeedPowder Wet \$125 Matrix SpeedBlock Wet \$95



Nathan applies fluoros at the Lahti Worldcup 2009

SPECIAL RACE SERVICE POWDERS AND BLOCKS

In addition to the regular line of Cold, Mid, and Wet powders and blocks from Holmenkol, they have developed special race service powders and blocks. These are made to supplement the regular line in specific conditions. As a general rule these conditions all involve newer snow and/or lower humidities than the regular line.

Cold 59 is used in very cold snow conditions, often when it appears a pure fluoro would not be ideal. This wax has the ability to make a ski accelerate in abrasive conditions where nothing else works.
30g Powder \$125

Mid 08 is used in a wide array of conditions with tremendous success. Designed for snow that tends toward dry, this wax will work in nearly all conditions in the Mid range. Testers this past year found that this was often the go-to wax in their box in a wide array of conditions and snow types, especially favored in the Rockies, MidWest, and Alaska.
30g Powder \$125 15g Block \$95

Wet 36 is geared for the warmer conditions but in drier snow and lower humidities, often found when substantial warming occurs during the day in typically drier climates.
30g Powder \$125 15g Block \$95

Holmenkol Mid 08

We like to call this "the sleeper wax," because very few people have heard of it, yet it is an amazing wax. This wax is an absolute must-have in every wax box. Yeah, it is that good. Working in conditions from 10F to 32F, it defies its own label. Mid 08 tends to be best in middle to dry humidity and new snow types but can work well in higher humidity as well. It differs from the regular Mid in the raw materials used and it does not have the nano-coating of the regular Mid.

HOLMENKOL MATRIX

Holmenkol's Matrix line is an HF paraffin line unsurpassed in quality in terms of performance and value. Not only is the Matrix line excellent in head to head performance against other brands, it is less expensive per gram than almost everything out there, period. When a wax is at or near the top in every test over a year period no matter the conditions and is very affordable, it has a place in our wax box. It should have a place in yours too.

**Matrix Yellow**

Cost per gram and on the snow: this is unbeatable HF Yellow. Matrix Yellow excels in warming temps throughout the day and lower humidity than most other yellow HF waxes on the market. Used in all snow types. If the snow is saturated and the humidity is high, Ski*Go HF Yellow tends to outperform Matrix Yellow.

2x35g \$65 150g \$99

**Matrix Red**

This wax offers unparalleled performance in all humidities and snow types. At BNS we hear over and over again that this is the best HF in the Red range, just put it on and forget it. No need to even test. The best part is the price—the best in the market per gram. Whether you are just getting into using HF waxes, or you are using them as a base layer you need to have Matrix Red as a staple in your wax box.

2x35g \$65 150g \$99

**Matrix Blue**

Blue was the number one HF paraffin we used last year. It is slightly softer than the green but has superior range and performance to nearly all other blue HF's in the market. This wax is a proven winner at all levels and a must have for any kit.

2x35g \$49 150g \$80

**Matrix Green**

Green is a harder wax that works across a wide range of humidities, but excels in low humidities. It also is very easy to work with, as it has a melting point lower than many other green waxes.

Blue and Green work very well in dry new snow as well as fine-grained and artificial snow. They are specially formulated with correct levels of fluorocarbons and special hardening additives for durability and performance.

2x35g \$39 150g \$69

**Matrix Black Line**

These waxes have a special black additive and generally work better than the regular Matrix line in old, dirty, and aggressive snow. They provide an extra shearing ability which helps keep the ski cleaner in dirtier older snow. These waxes also excel in man-made snow conditions.

Matrix Black/Yellow

One of the very few options for older dirty snow in the warmest range of waxes, this wax offers superior performance in all humidity ranges.

2x35g \$65 150g \$99

**Matrix Black/Red**

Very durable wax for older and aggressive snow conditions. Serves a key range for older snow.

2x35g \$65 150g \$99

**Matrix Black/Blue**

Works well in all older snow conditions: spring snow, corn snow, icy and older snow. A very durable wax that is easy to work with and safe for bases with a low melting point. Hugely popular in the Midwest.

2x35g \$49 150g \$80

IRON TEMPS FOR
MATRIX LINE

Green	140–145C
Blue	135–140C
Red	125C
Yellow	115–125C
Black/Red	125–135C
Black/Yellow	115–125C

Holmenkol Matrix Green and Blue have a lower melting temperature than many cold waxes, making them much easier to apply and safer for ski bases!

NORDIC RACING WAX MATRIX^{FX}

snow	humidity	new snow	old snow	coarse snow
-2 ~ 0 °C 28 ~ 32 °F	> 75 %	Yellow	Yellow	Black Yellow
	< 75 %	Yellow	Red	Black Yellow
-6 ~ -2 °C 21 ~ 28 °F	> 75 %	Red	Red	Black Red
	< 75 %	Red	Red	Black Red
-20 ~ -6 °C -4 ~ 21 °F	> 75 %	Blue	Blue	Black Blue
	< 75 %	Green	Green	Green

Holmenkol Base Wax Hydrocarbon

A simple three wax system for all snow types—there is no need to mix these waxes to make them work. Broad ranges and durability make these legendary training and recreational racing waxes. Available in three sizes and a combo pack to cover all of your needs.

3x35g \$14 150g \$20 6x150g \$80

Alpha Mix Yellow

For soft, new, and fine-grained snow. Alphamix is slightly harder than other yellows in the market, making it ideal for travel waxing and hot scraping.

Beta Mix Red

For all snow types, this wax works well across the entire humidity range. A great day-to-day wax for all uses: travel wax, cleaning wax, etc. Holmenkol's most popular wax.

Ultra Mix Blue

For cold weather, specifically old or dry-grained snow. Great durability.

**HOLMENKOL DIGITAL RACING WAXER**

Professional waxing iron with digital temperature display and electronic temperature control.
24423 – 110V
24422 – 230V
\$195

ROTO BRUSHES

Roto Speed Cork

Ideal for use on all fluoro applications. For use with SpeedStick (20685). 20673 \$50



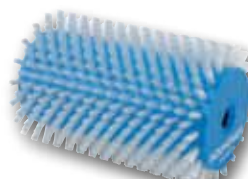
Roto Speed Brush Fiber

All around brush for glide wax brushing. For use with SpeedStick (20685). 20670 \$50



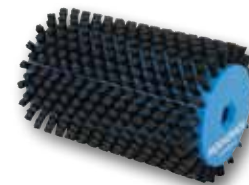
Roto Speed Brush Nylon

Great in all steps of the roto brush process, particularly used in finishing. For use with SpeedStick (20685). 20671 \$50



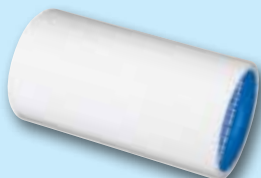
Roto Speed Brush Horsehair

Horsehair roto brush for glide wax brushing. For use with SpeedStick (20685). 20672 \$50



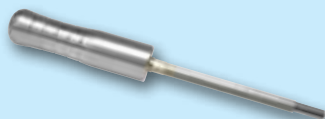
Roto Speed Fleece

Amazing roto fleece for finish brushing and polishing on fluoro applications. For use with SpeedStick (20685). 20688 \$60



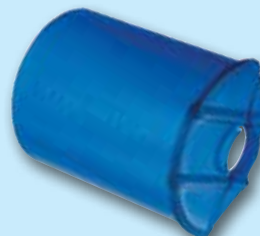
SpeedStick Pro II 120mm

Roto brushing handle. Single click quick-change mechanism. High quality full metal version. 20685 \$55



SpeedShield Pro II 120mm

Roto brushing protective shield to keep wax particles and dust from flying around. For use with SpeedStick (20685). 20686 \$30



Nano CFC Cleaner

Special Cleaner that dissolves Fluoro and cleans dirt while preserving the paraffin wax base. Essential for anyone using fluorinated wax products to refresh and thoroughly clean. More affordable small size coming soon. 24419 \$60



OVAL BRUSHES

Oval Steel Micro Finish Brush

Ultrafine steel brush for complete removal of excess wax from the base. The ultimate in brushes for the pro and the up-and-coming wax tech. Oval design maximizes bristle contact to the ski, thus completing the job quicker. 24523 \$90



Oval Nylon Brush

Universal ski base brush for polishing. Professional oval design. 24530 \$36



Oval Horsehair Brush

Natural ski base brush for preparation of speed products. Professional oval design. 24533 \$36



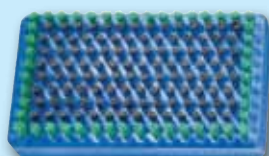
Oval Steel Brush

Very effective tool for cleaning the ski base before waxing and for brushing off paraffin waxes. De-tuning recommended. 24522 \$75



Base Brush Steel Micro Finish

Ultrafine steel brush for complete excavation of base structure. A must-have in racing. 24503 \$50



Base Brush Horsehair

Natural ski base brush for glide waxes. 24513 \$15



Wax Remover/Cleaner

For removal of kick wax, oil, grease and resin from the ski base. See 24419 nano-CFC cleaner for regular glide zone maintenance. 20421 500ml \$18
20422 1L \$28
Ground shipping only.



Service Box Big

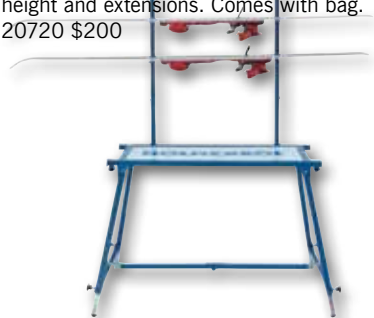
Large wax box with full assortment of drawers. The best way to transport your tools and wax materials. Lockable. 20703 \$99



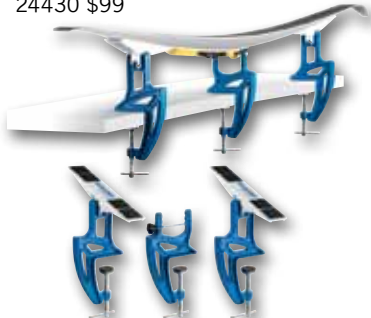
WAXING TABLES & PROFILES

Waxing Table Pro Including Bag

Portable wax table straight from the WC. With vertical ski supports, adjustable height and extensions. Comes with bag. 20720 \$200

**Nordic Waxing Spanner**

Very portable 3-piece vice set. Ideal for the beginner waxer or as a travel setup. 24430 \$99

**Waxing Profile**

Waxing profile with catch to be fixed on table or workbench. Adjustable length for skis from 160 to 210cm. 24444 \$200

**Race Waxing Table**

Highly valued and functional waxing table made of aluminum and stainless steel in a handy bag. For one or two workers. Does not include profiles. 24443 \$750

**Waxroom Nordic Ski Strip**

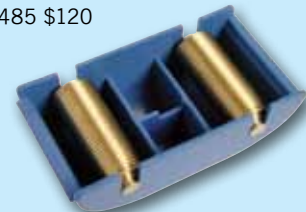
A waxroom must for organization! Holds 12 pairs of XC Skis. Can be fixed to the wall by tape or driving screws through the metal eyelets. 24690 \$18

**Bottle Bag 1liter**

1 liter drink belt with large pocket on top. Nice for keeping liquids cool or warm, top pocket excellent for carrying kick waxes, car keys, etc. 20967 \$40

**Cross Structure Tool**

Outstandingly effective structure tool with two rollers for cross pattern structure. This tool wins more structure tests than anything single tool we have. Use one roller for colder glazing conditions, or both rollers for wet conditions. 24485 \$120



WAXING ACCESORIES

Digital Racing Waxer

Professional waxing iron with digital temperature display and electronic temperature control.

110V 24423
230V 24422
\$195

**5mm Scraper**

Professional plastic scraper. Also available in 3mm version. 20631 \$7

**Pro Groove Scraper**

Professional groove scraper made from aluminum, different diameters work with all xc ski grooves. An excellent tool! 20638 \$30

**Synthetic Cork**

Great for smoothing kick wax. 20646 \$5

**Iron Cover**

Wrap it up! Heat resistant cover for protecting the most important tool you have. 24425 \$24

**Scraper Sharpener Pro**

The best scraper sharpener on the planet! Bench-mounted professional scraper sharpener with 4-sided steel blade. Keeps plastic scrapers square and sharp. Includes clamp. 4-sided replacement blades available. (20566) 20632 \$70

Replacement blade
20556 \$15

**Snow / Air Thermometer**

Don't be caught without this on raceday. Range -30C to +50C 20731 \$15

**Apron**

Use what the pros do! World Cup apron with many practical pockets. 20750 \$19



High Tech. Pure Nature. **NATURAL WAX.**



We tested this several times throughout the year against some of the racing waxes and found that speed and durability were exactly as the Holmenkol Germany guys had said: "maybe a bit too good."



The world's first biodegradable ski wax series.



Great news for winter sports enthusiasts looking for a wax with excellent gliding properties that is also environmentally friendly: Introducing the **Natural Ski Wax Series** by HOLMENKOL, a world first for alpine skis, snowboards and cross-country skis. Made from renewable raw materials, biodegradable and extremely easy to apply. The super compact Natural Wax Stick fits in any pocket, making it an ideal companion on the go.

www.holmenkol.com

Base Kick Wax Blue -12 to -4°C / 19 to 27°F Blue Special -6 to -1°C / 21 to 30°F Violet 0°C / 32°F Yellow -1 to +4°C / 30 to 39°F



Green -20 to -6°C / -4 to 21°F Blue Extra -7 to -2°C / 21 to 28°F Violet Special -2 to 0°C / 28 to 32°F Red -1 to +2°C / 30 to 36°F

Kick Waxes \$9 / Klisters \$10



Blue -20 to -3°C / -4 to 27°F Violet -4 to +2°C / 25 to 36°F Red -2 to +3°C / 28 to 37°F Red Spezial -2 to 0°C / 28 to 32°F Universal -4 to +4°C / 25 to 39°F Silver -1 to +3°C / 30 to 37°F Black Spezial -1 to +10°C / 30 to 50°F

Holmenkol kick waxes and klisters offer a solid line of grip waxes comparable to Rode. I have had exceptionally good luck with the Base Binder, Blue Extra and Black Spezial klisters.
—Nathan Schultz

CLASSIC WAX CHART																					
GRIP WAX			-25	-20	-15	-12	-10	-8	-6	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	+10
Base																					
Green																					
Blue																					
Blue Extra																					
Blue Spezial																					
Violet Spezial																					
Violet																					
Red																					
Yellow																					
KLISTER			-25	-20	-15	-12	-10	-8	-6	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	+10
Blue																					
Violet																					
Red																					
Red Spezial																					
Universal																					
Silver																					
Black Spezial																					

The New Propulse binding matched with the New S-Lab Classic gives the feel of the Pilot system without any worry. The new S-Lab classic boot has the RS17 pivot point - it has been moved back by 7mm over previous models, getting the flex point closer to the ball of your foot. This gives more control and better feel for the snow on the excellent S-Lab platform - buttery soft flex for kick with great torsional stiffness for control. 



S-LAB CLASSIC BOOT
SNS PROPULSE RC BINDING



"BY ANALYZING KICK AND ACCELERATION HOLISTICALLY, IN MOTION, WE HAVE A MUCH MORE COMPLETE UNDERSTANDING OF THE HUMAN, EQUIPMENT AND SNOW INTERACTIONS AND HOW TO IMPROVE THEM. BUT THE REAL PROOF IS HOW MUCH FASTER IT FEELS."

- ALEXANDER HAAS, SALOMON NORDIC PRODUCT MANAGER.

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SKI*GO INTRODUCTION

This is Ski*Go's seventh year back into the US Market. Many people remember fondly the cylindrical Ski*Go wax bars from their early days of skiing, especially the pink C242. Ski*Go is owned by former Swedish World Cup star Christer Majback. Most remember Christer's successes at World Championships as he earned a gold, two silver, and two bronze medals. In addition Christer won a bronze medal at the 1992 Albertville Winter Olympics. After his competitive skiing career, Christer decided to get into a new area of the sport by purchasing the remnants of the Ski*Go and Lind-Ex wax companies in the early 90s. Christer was very familiar with the Ski*Go brand of waxes, as both he and Gunde Svan endorsed the wax during their careers.

Since Christer purchased the brand, he has turned Ski*Go into a world class ski wax, glove, pole, and clothing company. Situated in the small town of Kiruna in the very North of Sweden, Ski*Go employs both in-house and contract chemists. These chemists contribute to the development of waxes along with Christer, who continues to test new waxes daily during the snow season. The result is that skiers get a very high quality wax for a great price.

BNS is now in its second year of distributing Ski*Go for the US market and we are very happy to have it. While there are many wax choices out there, not many can perform like Ski*Go across the entire line. We especially like the Ski*Go waxes in higher humidity conditions, anything above 50%. Although they will work well in conditions below that, they are nearly unbeatable in humidities above that.

It is important to note Ski*Go's emphasis on snow type when choosing which waxes to use. Ski*Go knows that the snow crystal type has more of an effect on the way waxes interact with snow than temperature, so pick the snow type first, then dial in the temperature to find the ideal wax.

Of note in the Ski*Go line are the pure fluoro performance relative to other brands. Consider this fact: Ski*Go was not even in the country seven years ago, yet at last year's US Championship races including US Nationals, Junior Nationals, and college championships, Ski*Go was the number one pure fluoro used. The reason? The Ski*Go lineup of powders, liquids, and blocks is easy to use, very durable, and has incredible speed characteristics. Skiers have caught on to this in a very short time because once you try it you become a convert.

Ski*Go HF kick waxes and klister are another must have in every wax box. Using a special proprietary fluoro formulation, Ski*Go has been able to make a lineup of four kick waxes and two klister that are easy to apply, very durable, and have amazing ranges. If we told you that you needed only four kick waxes in your box, would you buy them? Of course you would. Everyone loves Ski*Go HF kickers because they cover the entire range of conditions in four kick waxes and do it impressively well. See more on these waxes in the following pages.

SKI*GO GENERALIZATIONS

You will find that although Ski*Go works well in a wide range of conditions, it truly excels over other brands in higher humidity and wetter snow. We found that in areas like Colorado and the Midwest, Ski*Go really started to outperform other waxes in February and March. While it won a bunch of tests in the early part of the year as well, it was nearly unstoppable in the wetter snow and higher humidity of February and March in all regions. This also makes it an excellent choice all year in the Pacific Northwest, Coastal Alaska, New York and New England.

Ski*Go is a small company, but it is run by skiers. Ski*Go isn't interested in anything but helping skiers enjoy their sport and go faster. They constantly test

NEW Formulations for HF Violet and Red for 2010–2011. We tested these new kick waxes in New Zealand this July and were amazed – increased speed, the same famous kick, and better durability.

and tweak their wax line to make sure it is the best out there. Ski*Go uses development as a tool to improve their wax line, not to charge more for their waxes. This philosophy lines up perfectly with us at Boulder Nordic Sport and we hope that we can help you learn the Ski*Go wax line this year.

Ski*Go's style is a little different than most wax companies, and by different we mean very different. Ski*Go is a small Swedish company and they realized a long time ago that they cannot compete in the ski world with the bigger companies' marketing departments. Their solution was to make the absolute best wax and invest in Research and Development. Christer Majback, the owner of the company, is also on the chemistry team that develops waxes. He is also on the test team that tests new waxes. He is also on the team that performs service at high level events around the world. He is also the guy who deals with distributors around the world. This is the only way that Ski*Go can compete, and they do it very well. Ski*Go's philosophy is we won't outspend you or out-market you, but we will make skis faster than you. It is a simple philosophy that has served the company well as they have grown through the years. Thus, you won't see the fanciest packaging or posters from Ski*Go. They'd rather be out testing waxes and making skis fast. 

SKI*GO KICK WAXING ACCESSORIES

WAX REMOVER 250ML

Environmentally friendly, odorless, fastest to biodegrade wax remover on the market. We care about the environment, but we also love this for it's ease of use. Due to it's unique formulation you can also fly with this wax remover, unlike most.

68004 \$12



WAX REMOVER 1000ML

Same great stuff in a bigger bottle.

68007 \$30



NATURAL CORK SMALL

Very dense natural cork for all-around use. Equally versatile with kick wax and fluoro applications, we recommend the big version for applying blocks and liquids and the smaller version for kick waxes.

68150 \$4



KICKWAX SCRAPER

The simplest tool that no one had ever thought of! A great tool for cleaning the kick zones of classic skis. Small and effective, this scraper has beveled ends for cleaning kick wax or klister effectively. A must have for every classic skier or coach.

68341 \$5



FIBERLENE 40M

Anyone who has ever waxed skis knows the necessity of Fiberlene! Equally effective as a lint free way to apply wax remover to your skis or as a polisher and cleaner, Ski*Go Fiberlene is the standard on the market.

68330 \$16

Also in 20m \$9



HF KICK WAXES

These waxes are no longer a secret—the word is out! Using Ski*Go's proprietary fluoro mix these kickers provide amazing grip with the perfect amount of glide every time. Most importantly, they are durable enough to last for a marathon race. While a lot of companies make eight to ten kick waxes in their top line of kickers, Ski*Go makes four because that is all you need. Every kick box should start with these kickers and then you can think about adding more. We all know that new snow acts very different from old snow, but most companies don't differentiate in kick waxes, they use the same for both. Ski*Go makes it clear which kicker to use for which snow type making your choice easier every time.

HF YELLOW

+4C to 0C (39F to 32F) For all snow conditions. Wet conditions above freezing before the move to klister or for covering klister. These conditions perplex even the best waxers in the world, but this wax often solves the problem fast. Very good grip and glide when no other kick waxes work. \$25

HF RED

+1C to -3C (34F to 27F) For all snow types. Positive grip and excellent glide in the transition range where waxing can become a nightmare. This wax has saved many a day when waxing gets tough. New for 2010–2011. \$25

HF VIOLET

-2C to -15C (28F to 5F) For newer snow and fine crystal snow. Works well in all humidities. If it is under freezing and new or not transformed snow is present, this wax is your choice, no need to even test. New for 2010–2011. \$25

HF BLUE

-1C to -20C (30F to -4F) For all snow types except new snow. Provides a soft and distinct grip across its entire temperature range. If it is under freezing and the snow is old or transformed, this is the choice for top performance. \$25



LF KICK WAXES

Ski*Go makes two LF Kick waxes that use a fluoro content ideal for specific conditions.

LF ORANGE

A great wax in the transition area around freezing when snow is either wet or dirty, as it resists water and dirt very effectively. \$12

LF VIOLET

A key range of 32F down to 20F. This makes it a great choice many days of the winter. LF Violet also resists dirt well and works excellent in drier snow with a very positive kick and excellent glide. \$12

XC KICK WAXES

XC YELLOW

As the snow becomes more coarse than for orange. Try before moving to klister. \$9

XC ORANGE

For variable conditions around freezing. Former name: Ski*Go Yellow. \$9

XC RED

At freezing and just below. Good for improving grip with purple or blue in the 10-15cm just ahead of the binding. \$9

XC VIOLET

All snow types. Works even outside range listed on tin. \$9

XC BLUE

Very durable. Works well in coarse snow. Can be warmed in as an underlayer for warmer waxes. \$9

XC GREEN

All snow types in cold conditions. A good overlayer on other kickwax with penetrating snow. \$9

BASE BINDER

For abrasive snow conditions to be applied to help regular waxes adhere to the kick zone longer. \$9



Temperature		New snow	Coarse snow / ice
+10 °C	+50 °F	Violet XC Klister as a base + Orange XC Klister alt. Yellow HF Klister	Violet XC Klister as a base + Orange XC Klister mixed with Silver XC Klister alt. Yellow HF Klister
+5 °C	+41 °F	See above	Violet XC Klister as a base + Orange XC Klister mixed with Silver XC Klister alt. Yellow HF Klister
+2 °C	+36 °F	HF yellow alt. Violet XC Klister as a base (thin) + Universal XC Klister alt. Orange XC	Violet XC Klister as a base + Red XC Klister alt. Violet HF Klister alt. HF Yellow
0 °C	+32 °F	Blue XC ironed as a base + Orange LF (Orange XC cushion in pocket)	Violet XC Klister as a base + Red HF alt. Violet HF Klister
-1 °C	+30 °F	Blue XC ironed as a base + Violet LF or Red XC	Blue XC Klister as a base (thin) + HF blue alt. Violet HF Klister
-2 °C	+28 °F	See above	Blue Klister as a base (thin) + HF blue alt. Violet HF Klister
-3 °C	+26 °F	Blue XC ironed as a base + Violet HF or Red XC mixed with Blue XC	Basewax ironed as a base + Blue HF
-5 °C	+23 °F	Blue XC ironed as a base + Violet HF alt. Violet XC	Basewax ironed as a base + Blue HF alt. Blue XC
-8 °C	+18 °F	Blue XC ironed as a base + Violet HF	See above
-12 °C	+10 °F	Blue XC ironed as a base + Violet HF alt. Green XC	Basewax ironed as a base + Blue HF
-15 °C	+5 °F	Green XC	Basewax ironed as a base + Green XC, alternatively Blue HF

POLE CASE

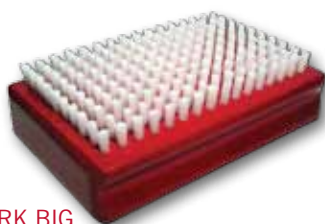
Comfortably fits 2 pairs of poles. Lightweight but durable. A great way to protect your investment.
80500 \$49

**LONG FINE STEEL BRUSH**

Our favorite steel brush! Very fine bristles penetrate the structure to get excess wax out. Used as a first or second brush for all waxes. Long bristles for ease of use and better feel on the ski.
68309 \$50

**NYLON SKI BRUSH**

A very nice all around nylon brush. The stiff bristles make it ideal for polishing or as a universal brush. At BNS we like to use this brush as our last step on all wax jobs.
68308 \$15

**NATURAL CORK BIG**

A BNS Favorite! This large natural cork is great for corking fluoros of all types. Does the job in half the time of other natural corks.
68151 \$7

**SCRAPER 5MM PLASTIC**

A very nice 5mm scraper with a cutout corner for working on edges of skis as well.
68201 \$6

**GROOVE SCRAPER PLASTIC**

A very nice groove scraper with multiple angles and sizes for cleaning any type of groove.
68340 \$5

**WAX IRON**

Great wax iron for the beginner waxer or someone on a tight budget. Dial temperature setting for easy use and lightweight for easy packing.
68353 \$50

**SKI*GO LF AND XC GRAPHITE GLIDE WAX**

Graphite is used for multiple reasons, but there seems to be confusion about why. There are two basic reasons for using a graphite underlayer when waxing:

1. Graphite provides a first layer that helps to harden the base making waxes more durable. In a lot of conditions, especially mid 20s to very cold conditions the harder the base the more durable the waxes, the lower the coefficient of friction on the snow, and the faster the ski.

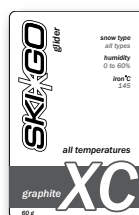
2. Graphite provides maximum dirt resistance. When a ski or wax picks up dirt it slows down drastically and quickly.

Not all graphites are created equal, however. The reason we sell so much Ski*Go XC and LF Graphite is because it is a very hard Graphite. The harder the graphite the better for keeping the base hard and the ski clean. At BNS we love the Ski*Go Graphite because it is the hardest on the market and yet very affordable.

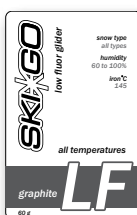
One question we get often is does Molybdenum or Moly do the same thing as Graphite. The answer is that they both work very similarly. The issue with the Moly waxes is that most are significantly softer than Ski*Go Graphite. This takes us back to hardening the bases and keeping them clean—the harder the wax the better.

Over the last three years we have run countless tests on wax and the vast majority come out that having Ski*Go Graphite as a first layer under whatever you are using will make it more durable and faster.

The difference between the Ski*Go XC Graphite and LF Graphite is simply that there are fluoros added to the LF. This helps to make the wax faster and more durable. While we recommend both, the LF Graphite is the choice for top performance.



60g \$10
200g \$25



60g \$25
200g \$65

FLUIDS VS POWDERS VS SOLIDS

Over the past fifteen years, pure fluorocarbon technology has evolved and we now have three distinct types of pure fluorocarbon waxes. There is some misinformation out there and even more general confusion on when to use these waxes. See the earlier sections which explain these in detail on pages 18–19. As a general rule, fluids are faster in transformed snow, with few exceptions. Fluids also are used as optimizers on top of powders in transformed snow quite often to increase initial glide speed and durability.

Powders will work in all conditions, but as a general rule they are the absolute choice in newer snow that is not transformed. Powders are ironed in so they will be the choice when durability is key.

Solids are great choices in most snow types and for shorter distance events such as sprints. Solids also are ideal for putting on as optimizers over the top of either powders or fluids for increased durability, initial speed, or additional dirt repulsion.

SKI*GO COLD POWDERS**C380 -7C to -20C**

Synthetic glide powder that is very good in a varying range of conditions from harsh new snow to older icy snow. Ideal in humidities below 60%. This powder is great as a top layer or mixed 1:1 with LF Green or HF Green. We have found this can really speed up these waxes in a wide range of conditions. Most important, it irons on the ski very well for a cold powder making it easy to use. Iron Temp 150C \$27

P16 -4C to -25C

Synthetic glide powder that works well in any aggressive snow or in artificial snow where the humidity is above 65%. Exceptionally hard powder yet easy to iron into the ski, P16 works well as a stand-alone layer or mixed with other waxes to harden them up.
\$35



Snow type	Coarse snow Artificial snow		Old snow		New snow		
Rel. Humidity Temp °C / °F	<60%	>60%	<60%	>60%	<60%	>60%	
+15 ... +5 C +59 ... +41 F	Yellow LF + C22	Yellow HF + C22	Yellow HF + C22	Yellow HF + C22	Yellow HF + C22	Yellow HF + C22	Top with C22 solid 
+5 ... 0 C +41 ... +32 F	Yellow HF mixed with Red HF + C22 Fluid	Yellow HF mixed with Red HF + C22 Fluid	Yellow HF + C22 Fluid	Yellow HF + C22 Fluid	Yellow HF + C22	Yellow HF + C22	Top with C44 solid 
0 ... -4 C +32 ... +25 F	Violet HF + C44 Fluid	Violet HF + C44 Fluid	Orange HF mixed with Violet HF + C44	Orange HF mixed with Violet HF + C44 alt. C105	Orange HF + C55/C99 Fluid	Orange HF + C105	Top with C105 solid 
-4 ... -8 C +25 ... +18 F	Red LF	Violet HF + C44 Fluid	Green HF + Orange HF	Green HF mixed with Orange HF + C44 Fluid or C55/C99 Fluid alt. C105	Blue LF + C105 Fluid	Blue HF + C105	
-8 ... -12 C +18 ... +10 F	Violet LF alt. P16	Violet HF + P16	Green HF + C380	Green HF (alt. Violet HF) + C105 Fluid	Green HF + C105 Fluid	Blue HF mixed with Green HF + C105	
-12 ... -25 C +10 ... -13 F	Green LF + P16	Green LF + P16/C75	Green LF + C380	Green LF + C75	Green HF + C380	Green HF	

HF = High Fluoro
LF = Low Fluoro

SKI*GO FLUID APPLICATION

The difference between a fluid fluoro winning the race and wearing off in a kilometer is application. We have done hundreds of fluid fluoro tests and we have a tried and true method to Ski*Go fluid application for optimum speed and durability. Ski*Go fluids will easily last 20K or more if applied correctly; they are the most durable of all liquid fluorocarbons. Simply follow these easy steps for a great experience with Ski*Go fluids:

1. Saturate the application sponge and apply on the ski.
2. Let dry for three to five minutes (or 20 if you have time).
3. Hand or roto cork with natural cork.
4. Let sit for ten to fifteen minutes.
5. Brush aggressively with white nylon.

It is also possible to iron Ski*Go fluids, though it is only recommended for people with experience ironing fluoros. To iron, put the fluid on the ski, then simply set the iron to 150C and take a five to seven second pass down the ski. Do not be alarmed that it will sound as if the fluid is "boiling" on the ski. This is normal and is not damaging the ski base. Let the ski sit for ten to fifteen minutes and then brush aggressively with white nylon.

SKI*GO FLUIDS

Ski*Go makes the best fluid fluorocarbons on the market hands down. They are very easy to apply, extremely durable, and fast in their specific conditions. To clarify what would be the best choice for you, here are descriptions of each liquid. As always, please call us if you need additional help deciding which ones are right for you.



C22

+15C to -2C Unbeatable in any wet conditions, especially above freezing, but also in to the mid 20s (F) in all snow types. You must have this in your box if you live anywhere that gets above freezing or has wet snow conditions.
\$125

C44/C107

+2C to -9C, very good in transformed snow conditions varying from saturated to ice. A must have for every serious racer. New for 2010–2011: C44 liquid is the C107 test liquid that made a splash in the last two years as a special release. C107 was so good, it beat C44 in almost all situations and is now the official C44.
\$125

C55/99

-2C to -10C, usually good in new/fresh snow, but can be very good in icy conditions in transformed old snow.
\$125

C105

-4C to -15C, this works well in older transformed snow or extremely fine-grained snow. Contains graphite.
\$125

APPLICATION OF SKI*GO BLOCKS

(see pages 18–19 for detailed application)

1. Rub on the ski.
2. Roto or hand cork into base using the large natural cork.
3. Let sit for five minutes.
4. Brush out with white nylon brush.

IMPORTANT NOTE* It is possible to iron in blocks instead of corking for added durability. Iron temp 155C. BNS recommends also putting an optimizing layer on top of ironed applications with hand corking for better initial speed. See Optimization, page 18 for more information on application of blocks.

SKI*GO SOLID BLOCKS

Ski*Go solids are ideal as an optimizer, for a sprint race, or as a budget fluoro choice for everyone. Application is simple and easy, no matter what method you choose.



C22 BLOCK

+20C to -4C All snow types. Interestingly enough C22 powder not only dominates in any wet snow near 0C and above, but also in extremely cold conditions well below its range. Due to the hardness and versatility of this wax, it can be used in all snow types as low as -20C. Test against C105 in those conditions.
\$99

C44 BLOCK

+3C to -9C Older, grainy snow at below 0C (32F), and newer wet snow at 0C and above. Very good for old snow down to -9C, extremely fast, test against 105 block. In new, and wet snow at or just above 0C it is worth testing against C22 solid. New Formulation for 2010–2011 (C107).
\$99

C105 BLOCK

+1C to -20C All snow types. We like this block as a cover in nearly all conditions below freezing. C105 almost never slows the ski down, and the majority of the time it really enhances the speed and feel of the ski. Should be tested against C44 when close to 0C and older snow conditions.
\$99

SKI*GO POWDERS

Ski*Go pure fluorocarbon powders don't have exciting names, but they are so good, you are bound to have a day where they give you the best skis you've ever had. Take note of the three Ski*Go fluoro powders. They are the best of the industry and definitely on the must-have list.



C22 POWDER

+22C to +1C All snow types. The #1 warm snow powder in the world. When the snow is wet and saturated C22 is always the choice with no need to even test. Very durable. Iron Temp: 170C–180C
\$130

C44 POWDER

+1C to -14C This is an improved formula over the famous C44 powder. New formulation introduced in 2009–2010. This powder will work in all snow but excels in grainy and older snow. This powder is a favorite both for its range and pure speed in a wide variety of conditions. Iron temp: 170C
\$130

C105 POWDER

+1C to -15C All snow types. This is quite possibly the most versatile powder in the world. When conditions warranted putting C105 in our tests, it won nearly 50% of the time over the last three years. It works in all snow types and is the cure for slow skis in the conditions below freezing. Iron temp: 150C–160C
\$130

"I was very satisfied with my skaters in McCall (World Masters), thanks so much for the job well done. Don't be surprised if you see a couple pair of our classic skis come your way for grinding in the next couple months..."

–Jeanne, Bend, Oregon

SKI*GO HF WAXES

Ski*Go has a very clear program for HF waxes, but it is important to note that you have to start with snow type first, then temperature to identify the right wax. BNS experts are always available to explain the line and help you find exactly what you need.

HF YELLOW New

For all snow types. The best wet snow/warm weather HF wax on earth! BNS has complete confidence in saying that when you get into saturated, wet conditions you don't even need to test, Ski*Go HF Yellow is the winner. Evolved from the old C242 formulation, this wax has been a proven winner for over 30 years. Does not pick up as much dirt as other HF's in this range. Iron Temp: 125C

HF ORANGE

For all snow types. For humidity above 60% and the area around OC. Works very well in new falling wet snow and snow that is rapidly warming. Iron Temp: 125C

HF RED

For artificial or grainy snow. Specialty wax specifically made for artificial snow. Iron Temp: 130C

HF VIOLET

Old or aggressive snow. HF Violet is the compliment to HF Blue in older or aggressive snow. With a huge range, this wax covers several waxes from other brands making it a great value as well. Possibly the most durable HF on the market. We sometimes mix it in to other waxes to add durability. Works well in any transformed snow. Iron Temp: 145C

HF BLUE

New snow. A wax specific to newer, not transformed snow. Covering a wide range, it is an easy choice when the snow has not transformed. Iron Temp: 130C

HF GREEN

All snow types. If humidity is greater than 60% and it is cold, this is the best choice out there. In lower humidities, Holmenkol Matrix Green is a better choice. Iron Temp: 145C

Ski*Go HF	Ski*Go LF	Ski*Go XC
50g \$70	60g \$25	60g \$10
200g \$175	200g \$65	200g \$25



SKI*GO LF WAXES

Low fluoro glide waxes for humidity between 50% and 75%. Spread and warm with a wax iron (temperature on package). For racing and training. 60g and 200g packages.

SKI*GO XC WAXES

A series of regular glide waxes for all temperatures and snow types. For humidity between 0% and 100%. Spread and warm with a wax iron (temperature on package). 60g and 200g packages.

	Wax	Snow type	Temp C / F
HF LF XC	yellow HF LF XC	all	+20..-1 / +68..+30
HF LF XC	orange HF LF XC	new to older	+1..-5 / +34..+23
HF LF XC	red HF LF XC	granular, artificial	+1..-5 / +34..+23
HF LF XC	violet HF LF XC	older, aggressive	-1..-12 / +30..+10
HF LF XC	blue HF LF XC	new snow	-3..-10 / +27..+14
HF LF XC	green HF LF XC	all	-7..-20 / +19..-4
LF XC	graphite LF XC	all	

Ski*Go's HF waxes make it simple. It is as much about snow type as it is temperature. Luckily the Ski*Go HF waxes cover the range of several waxes from other companies, making it an easy line to use. If it's very cold, use HF Green. In below freezing and new snow conditions down to -10 or so, use HF Blue. For the same conditions but older transformed snow use HF Violet. For artificial snow use HF Red. For around and just under OC and wet snow use HF Orange. In conditions of saturated snow from OC on up use HF Yellow.

GURU KICK WAXES AND KLISTER

Guru kickwaxes are one of those waxes that you hear about being used on the World Cup but you have never seen...until now. BNS brings these waxes to the general public for the first time ever. Originally made as "cowboy" waxes, these kickers and klisters have unique formulations that work across a wide range of conditions. Their proprietary formulas make them easy to apply and extremely durable.

GREEN -6C to -20C A softer green kick wax than you are used to with a black additive for durability. For cold, new snow and as a binder. Also mix with Red for variable cold conditions. \$20

BLUE -4C to -10C Very traditional blue but with better glide properties than most. Newly fallen snow and fine-grained snow. \$20

VIOLET -1C to -6C Newly fallen snow and fine-grained snow. This also mixes well with Guru Red in conditions at the top of Violet's range. \$20

RED 0C to -4C Newly fallen snow and fine-grained snow. Great mixed with Green for variable colder conditions. Excellent kick and broad range. \$20

YELLOW +1 to -2C Fresh falling snow around freezing with silver in it. \$20

EXTREME HALLGEIR -2 to -10C Awesome binder and also works well as a cover on top of Extreme 39 klister. Best in coarse-grained and man-made snow. Very good as a top layer to make a "shell" to increase speed. \$24

SUPER HALLGEIR -3 to -15C Like Extreme Hallgeir but with a silver additive and a colder range. This works well on its own or in a cocktail mix with other waxes. \$24



KLISTERS

GREEN -6C and colder. Base Klister, for fine and coarse grain snow. \$22

BLUE 0C to -8C For fine- and coarse-grained snow; works well as a hardener and mixed with other klisters. \$22

VIOLET +4C to -5C For fine- and coarse-grained snow. \$22

RED +5C to +15C Great klister in fine and coarse grain old snow and corn, a BNS favorite. \$22

EXTREME 39 +7C to -2C Incredible Klister to mix with others for grainy and man-made snow. A universal klister for just below freezing and above. A World Cup favorite. You need this. \$30

EXTREME 39 HARD +4C to -5C Tougher version of Extreme 39. Works better in icy conditions. Also works well as a binder klister. \$30



Rex Wax is a lesser-known Finnish brand that has some great products that tend to excel in Finnish-style snow: old, coarse, hard snow. We've cherry-picked a selection of our Rex favorites here.

REX RCF PINK GLIDE WAX is an excellent medium fluorinated paraffin used to harden up wax applications for dirt repellency and durability. We used this wax at World Championships in 2009 as a base layer in coarse new snow and rain because the snow was extremely dirty. Tested very well, especially after skiing for 5km. Excellent for old, coarse, aggressive and man-made snow. 0C to -20C. 100g \$20

REX RCF GRAPHITE 100g \$20

REX TK-72 PURE FLUORO BLOCK is an excellent top-coat rub-on for cold snow and excels in coarse and humid snow in the range of 0 to -18C. 20g block \$110

REX TK-50 PURE FLUORO POWDER performs very well in warm and wet snow, especially with coarse crystals above 0C. Works well in dirty snow. 30g \$140

REX HF OLYMPICO YELLOW wax is one wax that occasionally gives Ski*Go HF Yellow a run when the snow is wet above 0C. It is very hard compared to many other warm waxes and therefore works well to repel dirt in sloppy conditions. Put this over RCF pink and cover with TK-50 for a durable, dirt-resistant solution for wet, dirty, icy spring snow. 40g \$62

REX HYDREX + LIQUID FLUORO Fluorinated liquid for use as a glide top coat +3C to -3C on wet, coarse snow and also as a cover for grip wax and hairies in all temperatures to speed the kick wax up and prevent icing. Amazing stuff. \$85

REX KLISTER are a cult favorite because they are known for durability and solid grip in tricky conditions. 55ml tubes \$12.50

BLUE - icy snow -5C to -10C

PURPLE - icy snow 0C to -7C

RED - new wet snow +10C to 0C

SILVER - coarse wet snow +/- 0C

SILVER SPECIAL - soft universal +/- 0C

OI ORANGE - new/old wet snow +10C to 0C

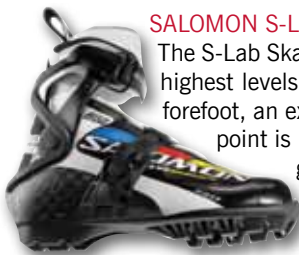
OU YELLOW - slush +10C to 0C

OV BROWN - old coarse wet +10C to 0C

UNIVERSAL +10C to -30C



SKATING



SALOMON S-LAB SKATE PRO

The S-Lab Skate Pro is the evolution of many years of testing at the highest levels. It adds a carbon fiber cuff, power strap across the forefoot, an extended carbon fiber heel cup and RS-17 – the pivot point is moved 7mm back from previous generation boots to give a better skate push. This boot upgrades performance with more stability, adjustability and support and was a success in our long-term testing. BNS also has special “racer fit” boots that are narrower than the production version, as well as the S-Lab without the power strap but with the Carbon Cuff. Tends to run big - most people size down one-half (UK) size over the previous generation.



ALPINA ELITE CARBON SKATE - ESK



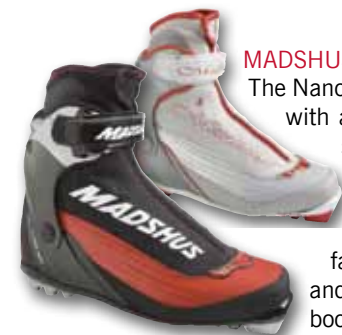
The Elite platform has a minimalist design for an ultra-light, direct connection to the ski. Amazingly light, the ESK uses 3-D carbon molding on the cuff to provide just the right stability without getting in the way. Improved cuff and heel design for more clearance make this a favorite for top racers and added insulation is a welcome improvement over last year's sometimes frigid ECS. We also have this in a BNS-exclusive “cuff-less” version like Kris Freeman and Petter Northug use for those looking for even lighter weight and more freedom of movement.



FISCHER RCS CARBONLITE SKATE



A totally redesigned boot from Fischer that utilizes a World Cup Carbon Crosslink and World Cup Carbon Cuff. The cross-link provides tensioning across the foot in a V-pattern, offering volume adjustment across the entire foot. It also features a canting system that enables individual cuff adjustment and a torsion control system for increased power transfer to the ski. We were pleasantly impressed with these boots this spring and think they represent a solid choice for skiers. See page 41.



MADSHUS NANO / ATHENA SKC



The Nano SKC features a PVC-free Cordura lower blended with a soft shell lace cover to let moisture out while stopping snow and water from coming in. The lightweight Nano SKC features the proven full carbon cuff, heel counter and lastboard for incredible torsional stiffness. This was one of our favorite boots last year because of its excellent fit and performance. People smile when they put this boot on. See page 23.



ROSSIGNOL XIUM WC SKATE



Rossignol has a new design and different materials for its skate boot this year. They are using a water-resistant material and have added asymmetrical lacing for a more precise fit and improved comfort. The new boot is 100g lighter per pair with a completely redesigned fit. See page 42.

The BNS crew was able to demo this year's boots at Devil's Thumb last January. An across-the-board consensus was that we were all impressed by the improvements we saw in every new model. We felt that each of the companies had correctly identified the areas that needed improvement and succeeded in creating more comfortable, responsive and lighter boots. The boots available today are far superior to what we saw 3–5 years ago, and the available selection of high-quality boots is unprecedented.

BOOTS & BOOT FITTING

We demand a lot of our boots, and they need to keep us warm, dry and comfortable under extreme conditions and for long periods of activity. Like everything else we do at BNS, when we work with boots, we're obsessed with finding the best fit. Here are some suggestions gleaned from our clients' feedback combined with our experiences skiing, racing and on-snow testing every boot made.

HOW TO FIND THE RIGHT BOOT

We advise all of our boot shoppers to try a wide range of boots in order to determine which brands and models match their foot shape. Boot technology has dramatically improved in the last 3 years, so most of the boots on the market today have excellent performance, making fit and comfort almost take priority over boot features and binding compatibility. Limit your choices by fit first, then compare features of the boots that made the cut.

We are often asked what you get by buying a more expensive boot. In general, you get a boot with higher quality materials that are lighter, stiffer, and have better performance. You also get a better engineered boot that fits better and lasts longer. It's that simple.

Choose a thin or medium weight sock when possible, as heavier weight socks tend to make the boot feel sloppy and can actually make the foot colder by reducing circulation. If you have trouble with cold feet, a boot cover is much more effective than thick socks. New boots should be fit quite snugly as they will “pack out” and loosen up as they break in. Generally, the length of the boot will not change but the width and volume will expand with time. Find the appropriate length and then try to get the snugest fit that is comfortable. Note that many adjacent sizes share the same sole (and therefore the same length) but offer more volume for the larger size. A boot is too tight if it squeezes your metatarsals (the bones just behind your toes that form the ball of the foot).

SKATING BOOTS

The skating motion requires torsional and lateral stiffness in a boot to provide stability and power transfer. Performance in a skate boot comes from stability in the heel, a rigid sole, and a snug, precise fit. The boot should have a little room in front of the toe, ideally somewhere between the fit of a cycling shoe and a running shoe. When standing on the whole foot, your heel should feel solid with little or no lateral motion if you push sideways, imitating a skate push off. There should be no rubbing if you transfer your weight from left to right in a skating motion. Your heel will lift up if you step onto your toe. If you make that motion while skating, you need to attend one of our technique clinics, so don't worry about it. As long as you don't get any lateral motion or rubbing in the heel as you push off laterally with the entire foot, the boot will work well. We've tested this theory on snow many times with many different models of boots.

CLASSICAL BOOTS

Classical boots need a bit more room in the toe as you will be pointing the toe and bending the boot under the ball of your foot (dorsal flexion). The heel should feel snug as you roll from standing on the whole foot to standing on the ball of your foot. Toes should not hit the front of the boot at any time during this motion. You don't need to worry much about lateral motion in classical boots, but it does not hurt to push from side to side and verify that there is no significant rubbing or slop.

BNS HAS FREE OUTBOUND SHIPPING ON 2010-2011 MODEL BOOTS UNTIL DEC 1, 2010

We know that ordering boots over the internet is tough, so we do several things to make it easier for you. First, we provide you with information in this magazine, as well as at bouldernordic.com and our staff is available to consult on boot questions so that we can make the best assessment possible from a distance. Second, BNS will offer free outbound shipping on all boot purchases until December 1, 2010. We accept exchanges on boots that are in new condition, so if you try the boots on and don't like the fit, call us and we'll suggest alternatives and get the boots to you to try. This gives you the confidence that you will get the right boot for you and you don't have to settle for anything less than the best fit.

The fine print: continental-US destinations only. Cannot be combined with any other offer, does not apply to sale items.



BOOT FITTING ADJUSTMENTS

Research the available options and make sure you have the ideal size and configuration to fit your foot. Boots often come in women's and men's versions these days with women's boots having a narrower heel, higher arch and more room for larger lower-calf muscles. Some boots offer very useful options such as 1/2 sizes, narrow versions, heel cup adjustment and volume-filling insoles, so be sure to be aware of these as they can really help you find the perfect fit. We are obsessed with fit, and understand the value of a perfectly sized boot, so we try to carry these "weird" options and sizes that are hard to find elsewhere. New this year, we have the option to create custom Alpina boots made specifically to your foot in certain models.

INSOLES

One of the easiest ways to improve fit, comfort and performance is to replace the limp stock insole with something that supports your foot better. We have found that aftermarket insoles and custom orthotics make a huge difference in control and comfort and they really should be a consideration for every serious boot purchase. Our Superfeet and Sole trim-to-fit insoles and custom insole machine are a quick and inexpensive upgrade option that work for about 90% of the population, with the remainder needing specific corrections that only custom orthotics can provide.

COMPARING FEATURES

Once you have narrowed the field down to the boots that fit, compare the features and overall quality of the boots. You are not buying walking shoes, so instead of walking around in them, imitate the movement patterns of skiing. Push from side to side on skate boots, transferring your weight from left to right. For classical boots, roll onto the ball of your foot not on your toes) and push down, noting how the sole flexes. It should be supple and allow you to push down where you want to on the ball of your foot.

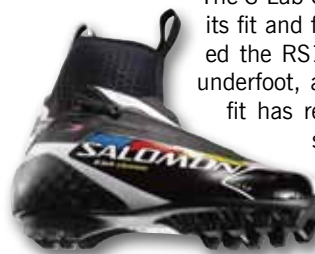
Evaluate weight, quality of materials, ease of entry, warmth, support, freedom of movement, adjustability and sole stiffness/flex. Do the boots give you a good feel for the ground, or do they insulate you from feedback?

Hi Nathan,
The ski boots I ordered arrived here in 6 days so very efficient! They fit well but only problem is no snow yet!

Thanks,
Gyll, Australia

CLASSIC

SALOMON S-LAB CLASSIC



The S-Lab Classic is one of our most popular boots due to its fit and features. This year the S-Lab Classic has added the RS17 technology, moving the pivot point farther underfoot, and an improved heel hold. The performance fit has relatively low volume and a one-piece carbon sole making it one of the lightest, stiffest boots around. Everyone who uses this boot in our shop likes it for fit, support and the precise, supple feel it provides. BNS also has this available in a "racer fit" version, with lower volume. See page 29.

ALPINA ECL



The ECL is a new paradigm and everyone's favorite boot. The sole gives an unprecedented feel for the ski and snow and the fit is fantastic. This year's improvements include a new heel grip lining for increased comfort and added insulation for warmth. Everyone who tries this boot raves about it as the best boot they have ever skied.

MADSHUS NANO/ATHENA CLC



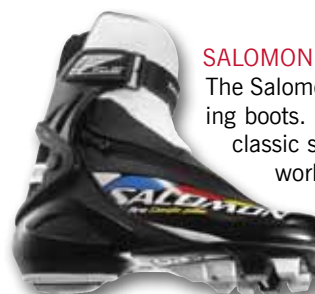
The new Nano/Athena CLC is now the lightest classic boot on the market. It has a redesigned PVC-free Cordura along with a soft-shell membrane to allow maximum breathability while maintaining water resistance and durability. The Madshus Nano/Athena also features a soft forefoot flex for unsurpassed fit and comfort and a sensitive feel for the snow and ski underfoot. See page 23.

ROSSIGNOL X-IUM WC CLASSIC



The Rossignol X-Ium WC Classic boot features all new materials and design for a high quality and lightweight performance classic boot. Some of the new features include a free-flex sole, low volume option, and thermo adjustable liner for improved fit and control. The early reviews of this boot have been exceptionally positive. See page 42.

SALOMON PRO COMBI PILOT



The Salomon Pro Combi Pilot boot is one of our best selling boots. It is an affordable option for both skating and classic styles. It is an incredibly comfortable boot that works well for beginning classic skiers as well as a lightweight backcountry/touring ski boot option.



CRAFT PXC LIGHT SET

The Craft PXC light set is an excellent light-weight training pant and jacket with a wind protective front and a thin ventilating fabric on the back. It is ideal for athletes in milder climates or those that produce a lot of heat, as it is one of the lighter weight pieces we have seen. Tends to be one of the more fitted pieces available and is a favorite among many of our customers. Available separately or as a set.

NEW

SALOMON SUPER-FAST JACKET FOR WOMEN

Salomon's new Superfast jacket provides light insulation, great breathability and a motion friendly fit for Nordic skiing. It is a great looking jacket at an affordable price. Light to medium weight ideally suited to everyday training in most winter conditions.

SALOMON MOMENTUM II SOFTSHELL PANT FOR WOMEN

Complement the Superfast Jacket with a new softshell training pant from Salomon. This pant features wind protection on the front and breathable fabric on the back. It also has half-zip legs for easy removal over boots. Slim fit.



SWIX PRO X JACKET AND PANTS FOR BOTH MEN/WOMEN

The new Pro X jacket and pant is Swix's top level training set, using the latest technical 3-layer membrane/softshell with bonded details. What does that mean? When you put this stuff on, it feels right – the cut, the fabrics and the details make you happy. The jacket has laser cut underarm ventilation for optimal ventilation, pre-shaped sleeves for increased movement, and reflective details for visibility in the dark. The Pro X pants feature pre-shaped knees for increased movement, a zipper from the thighs down and are wind and water repellent. Both have a slim fit and are on the lighter/thinner side for endeavors where you are staying active.



NEW

CRAFT ::

SALOMON

SWIX



CRAFT ::

CRAFT BASE LAYERS are the best-fitting, most technical and softest we have tried. Pro Zero Extreme for high-intensity or warmer days, the thicker Pro for extra warmth or add a Windstopper layer for wind protection and extreme cold. These base layers move with you and are made specifically for the demanding full-body motion of cross-country skiing.

CRAFT PRO ZERO WINDSTOPPER GUNDE SHORT

A must have for male cross-country skiers. The Gunde short has full wind protection in the front and a soft fabric throughout, providing vital insulation and protection.

Check bouldernordic.com for Craft's complete line of professional, cross-country-ski-specific underlayers.

THERMOMETER KEY

WARM



COOL



COLD!



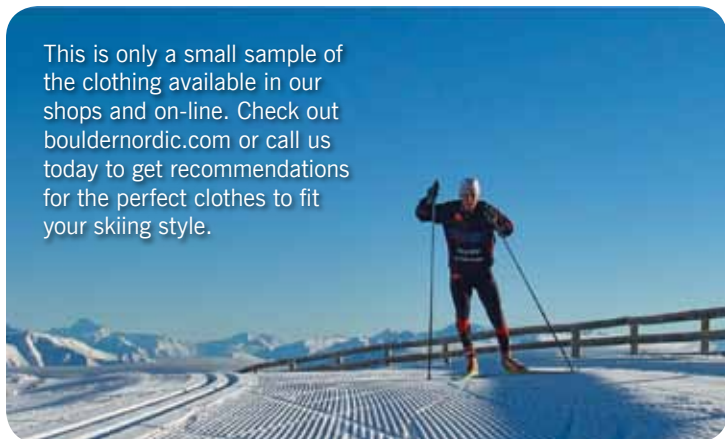


HOLMENKOL DRINK BELTS are insulated with a wide-mouth so your drink stays warm and doesn't freeze around the lid. There is a roomy top zippered pocket for carrying kick wax, energy bars, iPods, etc.



CASCO NORDIC SPIRIT COMPETITION – The popular Casco shield adds another model to its stellar line up. The Nordic Spirit Competition comes in both a small and large option to help refine the fit. It has a sleeker design than the Nordic Vautron Shield.

This is only a small sample of the clothing available in our shops and on-line. Check out bouldernordic.com or call us today to get recommendations for the perfect clothes to fit your skiing style.



BNS SUIT

Join the BNS Team! The custom two-piece BNS suit is made by Podiumwear from their highest quality Pro Line using dimpled Swiss-Tech Lycra for a great fit. Comes in XS-XXL and it is possible to special order different sizes in the top and bottom.



SKI*GO X-SKIN The X-Skin is a very thin and supple racing glove with excellent breathability. It features a windproof top and a very thin palm made of the highest quality Clarino for good feel and grip. New for 2010–2011, the X-Skin more shaped to fit your hand better. This is a lightweight glove good for use down to about -8C (18F). \$49



YOKO THERMO+ AND THERMO+ LADY The Yoko Thermo + and Thermo + Lady is one of the industry leaders and it sets the standard for an excellent medium-weight training or cold-weather race glove. It features a C-100 Thinsulate for extra warmth and a Clarino palm. Temp range approx -10C to 0C (14F to 32F) \$38



SKI*GO THERMO The Ski*Go Thermo is a great medium weight glove for racing in slightly colder temperatures than the X-Skin, with a lycra front and a thinsulate lining. It has fleece reinforced fingertips and the highest quality Clarino palm to provide a supple feel and excellent grip. New for 2010–2011, more insulation around the fingers, and more fleece inside for better warmth and feel. Temp Range: -12C to 0C (10F to 32F). \$49



SKI*GO JUNIOR New for 2010–2011, the Ski*Go Junior is much warmer and an excellent glove for kids who are goofing around, falling, etc. Similar to the adult Thermo. This glove prototype was tested last year in Kiruna, Sweden North of the Arctic Circle and received the stamp of approval from parents and coaches. Temp Range: -12C to 0C (10F to 32F) \$29



HESTRA WINDSTOPPER RACE TRACKER The Hestra WS Race Tracker is a favorite racing glove among the BNS staff. It features a gore windstopper material with a clarino palm. It also has a brushed polyester lining to increase its warmth, and is one of the warmer gloves out there. Recommended for most people in the range -15C to -5C (5F to 23F). \$65



YOKO GORE WS The legendary Yoko Windstopper returns! One of the best cold-weather gloves ever due to its incredible warmth in a thin, light package. Using a layer of Gore windstopper fleece to insulate and protect from the wind, this glove will amaze you with its warmth in extreme cold conditions. We've raced marathons with this glove on windy days at -10F (-23C) without issue. A great cold-weather racing glove or training glove for cold days or people who have cold hands. \$60



YOKO ARCTIC GORE WINDSTOPPER LOBSTER Sure to be one of our big sellers this winter. It features C-100 Thinsulate plus additional insulation and a WS softshell for ultimate warmth and wind protection. If you hate cold hands, then these are the gloves for you. Temp Range: BRRR. \$65



SKI*GO HUMMER PRO The Hummer Pro is a very warm, wind-proof "lobster" glove with a thinsulate lining and the highest quality Clarino palm. It is a great glove for really cold days and is one of the most popular gloves we sell. It provides excellent warmth in frigid conditions while maintaining feel for the poles. New for 2010–2011, improved fit and finish. Temp Range: Cold/Windy/Bitter. \$49



FISCHER DOMINATES IN VANCOUVER

New record: Fischer athletes have never won as many Olympic ski medals as they did in Vancouver 2010. The medal count in the four Nordic sports shows an impressive 31 gold, 19 silver and 24 bronze medals – over half of all the medals awarded. Fischer has proven once again that there is no doubt who is the #1 ski in the Nordic racing world.

The #1 racking also applies for the first time to Fischer boots as Fischer was the most successful boot brand at the Vancouver Winter Games, winning more medals than any other company. The innovation company from Austria is unrivalled in its leading position in the medals tally for Nordic skis and boots.

CARBONLITE DEMO CENTER

Now you can try the most successful skis and boots from the Vancouver Winter Games. The RCS Carbonlite skate and classic skis along with the new RCS Carbonlite boots won more medals than any other brand in Vancouver.

Once you have tried Fischer you will understand why more World Cup athletes choose Fischer products than all the other brands combined. Visit one of these Carbonlite Demo Centers for a complete selection of RCS Carbonlite skis, boots and poles.

NORDIC PODIUMS IN VANCOUVER (CAN)

SKIS	GOLD	SILVER	BRONZE	TOTAL
FISCHER	31	19	24	74
MADSHUS	12	9	11	32
ATOMIC	3	12	6	21
ROSSIGNOL	2	7	6	15
PELTONEN	0	1	0	1
elan	0	0	1	1
SALOMON	0	0	0	0
TOTAL	48	48	48	144

BOOTS	GOLD	SILVER	BRONZE	TOTAL
FISCHER	13	6	10	29
MADSHUS	9	8	10	27
SALOMON	10	5	8	23
alpina	6	7	6	19
ROSSIGNOL	2	8	5	15
ATOMIC	2	8	3	13
TOTAL	42	42	42	126

Individual and team competitions; Brand statistics



THE DAWN OF A NEW ERA: RCS CARBONLITE SKATING

This generation sees Fischer setting new standards in the high-end boot sector. And for this purpose they have developed technologies that are especially designed with optimum functionality for greater comfort and maximum user friendliness.

Besides the European Ski Award the RCS Carbonlite Skating has also won the red dot design award. The coveted award for first-class product design was presented by the international jury not only based on the inner technical merits of the product but also because the design statement meets exacting standards.

The RCS Carbonlite Skating won a whole host of medals at the Winter Olympic Games in Vancouver (CAN). The prestigious design award adds further value to these impressive sporting achievements.



reddot design award
winner 2010



EUROPEAN SKI AWARD
WINNER 2010



THE LIGHTNESS OF WINNING: THE NORDIC HOLE SKI

Thanks to consistent research and passionate development work, Fischer – together with the best athletes in the world – continues to extend its lead as the Nordic Number One over its competitors. And this greater lead has also clearly resulted from less weight this year, too. Because nothing weighs less than nothing, Fischer underscores its practice-oriented innovative strength even in weight reduction – an area in which all possibilities had seemingly been exploited previously. This gives the cross country skier greater harmony in movement and more exact skating strides with every step they take. Thanks to the higher stride frequencies as a result, Fischer once again increases its lead in the never-ending race for technological supremacy.

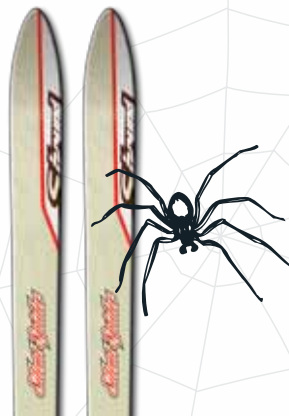
PRACTICAL COMPETENCE: QUICKFIT STRAP

With the latest development Fischer once again shows its unique power of innovation. With regard to the high requirements in the biathlon and to increase user friendliness for everyone, a decisive detail has been added to the proven wrist strap system to improve it even further: the new QuickFit Strap enables you to insert/remove your hand as quickly as possible without affecting the perfect fit of the strap!



FOR SUPERIOR CLIMBING: SILENT SPIDER

A great ski for in or out of track skiing, exploring your state parks, snowmobile trails, or the local back yard. Features a wood core air channel construction, with a durable sintec base. The Silent Spider uses the Mountain Edge Tec for added control and a perfect combination of grip and glide.





NEW
XIUM
SO LIGHT, SO FAST

WEIGHT SAVINGS: SKIS -15gr, BINDINGS -100gr, BOOTS -100gr
Overall, the package is 210gr lighter, which at 1 stride every 3-4m,
is over 1300 lbs weight savings in a 10k race. Think of the savings in a marathon!

NEW LACE SYSTEM + BETTER HEEL HOLD + NEW XCELERATOR BINDING = IMPROVED STABILITY

BNS & SKIS

Skis are our focus at BNS, and we invest a huge amount of time, energy and money in understanding the skis that we carry. We recognize that the absolute quality of your skis is the foundation of your experience on snow. Every pair of high-end race skis that we have in inventory has been hand-selected to meet our quality criteria.

We travel to factories in Europe every year to meet with the engineers who design these skis and the World Cup technicians who support them. We also work with athletes and test skis extensively on our own to get a

better understanding of how they work in the real world. We combine all of this knowledge and experience to bring together an inventory of skis that is unsurpassed in quality. We're happy to say that we have the highest quality inventory of skis available anywhere.

While race skis are obviously our specialty, there is a lot more to cross-country skiing than just hammering on the tracks. We carry a wide range of models for all of the fun things we do on snow.

We could write a book about skis but fortunately for you, space limits us to completely inadequate one-line summaries of each model on this page. We invite you to take advantage of our experience and knowledge. Drop by one of the shops, call, or go to bouldernordic.com for detailed product information and expert guidance to help you find the perfect ski.



ALWAYS MORE INFORMATION AT
BOULDERNORDICSPORT.COM



FISCHER SPORT

FISCHER RCR SKATING VASA An excellent value for recreational skiers or racers. Shares the same base as RCS, but heavier and not as supple.

FISCHER RCR CLASSIC/CROWN VASA Easy to kick and good glide for recreational skiers or beginners. Available in crown or waxable.

FISCHER CRS SKATE/CRS CLASSIC New for 2010–2011, this beginner ski has life and camber to it that is hard to find in most beginner models.

FISCHER TOURING

FISCHER SUPERLIGHT CROWN Great ski for on track or light off track skiing. Lightweight race construction with extra width for stability.

FISCHER RIDGE CROWN WAXLESS In-track model with reliable grip and durability for entry level through intermediate.

FISCHER BACKCOUNTRY

FISCHER SILENT SPIDER Waxless Metal Edge that is the sweet spot for in- or out-of-track skiing, exploring a state park, snowmobile trail or other adventure. 3/4 metal edge with ceramic edge in grip zone.

FISCHER COUNTRY CROWN Trusty partner away from the tracks and trails. Great choice for lots of adventures. Traditional touring length, waxless.

FISCHER SNOWBOUND CROWN Designed with some sidecut to help carve turns, but it is focused on backcountry travel from point A to Point B with efficient grip and glide. Metal Edge.

MADSHUS BACKCOUNTRY

MADSHUS GLITTERTIND MG+ Backcountry touring ski for lightweight, sturdy, all-round performance particularly well suited for off-trail and powder snow skiing. Full-length steel edge.

MADSHUS VOSS MG+ A responsive Torsion Cap and Multicore construction gives the Voss a light, soft flexing tip and tail, while the 3/4-length steel edge provides sure grip.

RACE SKIS

FISCHER CARBONLITE & RCS SKATING Fischer skate skis have a moderate to low camber with a very stiff and elastic finishing flex. We like these skis because the response is immediate, and they “give back” a very high percentage of energy. The Fischer design is the most versatile and universal we’ve ever seen – a single great pair of skis can be outstanding in an extremely broad range of track conditions.

FISCHER CARBONLITE & RCS CLASSIC Fischer classic skis are legendary for their combination of speed and secure kick. The 812 construction that was introduced nearly a decade ago set a standard that has been emulated by almost every other manufacturer. The magic of the 812 is that the pocket is positioned well forward under the foot, and closes easily when pressure is applied through the ball of the foot. This means that the ski is fast and free in a neutral gliding position, and kicks easily when you roll onto the ball of the foot.

ROSSIGNOL WCS SKATE Rossignol skate skis have a very high and active camber with a relatively soft finishing flex. This means that the give and take of energy on these skis happens on a large scale. They demand a lot, and give a lot back, creating a snappy and energetic feel with outstanding stability. While Rossignol has always had great skis for hard snow, we’ve found some excellent soft-snow characteristics in this year’s inventory, and are confident in our ability to provide skis for all conditions.

ROSSIGNOL XIUM CLASSIC Rossignol has prioritized secure kick in their classic ski design, and has delivered by building their pocket so that it closes to a flat finish. This ensures that the whole pocket gets pressured equally during the kick, and the ski is less demanding of a forward kicking position than other models.

MADSHUS NANOSONIC SKATE Madshus skate skis seem to be made for active skiing. They’re fast enough when they’re flat on the snow, but they really shine when you’re in an active position – with the ski on edge. Many people interpret this to mean that they’re good at high speeds (which is true), but we’ve found that they are rewarding at any speed, provided you are active and moving on the skis.

MADSHUS NANOSONIC CLASSIC Madshus classic skis have the longest wax pocket of any ski in production, running five to eight cm longer than any other brand. They have a modern forward-positioned pocket providing a great combination of kick and glide.



Cross-country ski poles need to be light, stiff, strong and comfortable. When deciding what pole is right for you, evaluate the grip and strap, the shaft and the basket. As you spend more on poles, they tend to get lighter and stiffer with smaller, race-oriented baskets. The weight of the shaft and basket will determine the swing weight, which you will notice more than absolute pole weight. High-end poles are ridiculously light and fly between pole plants while less expensive poles are slower on the return and feel "klunkier."

The stiffness of the shaft increases also as you move up the line. It is important to evaluate how stiff your pole needs to be based on your weight, how strongly you push off and the length of the pole. Stiffer poles are better for everyone, but taller men who are putting more weight on longer pole shafts (which flex more) will want to invest in stiffer poles or they will feel like they are using noodles.

BNS offers a wide range of Carbon and Aluminum poles to cover almost every situation - from the backcountry to the World Cup. We've featured our most popular poles here, but if you don't see what you're trying to find, visit bouldernordic.com for our full selection.

Due to their length, poles incur a large-package shipping charge.

SWIX TRIAC

The Swix Triac 1.0 Pole is an amazing step forward in pole technology with a complete re-examination of every component of the pole. The attention to detail in every aspect is impressive.

We at BNS are always skeptical of new pole developments, but after skiing on this pole for three months, we have to say that Swix really has made a big improvement. Everything about this pole has changed from the previous gold standard, the CT1. Some changes are radical like the dramatically stiffer triangular shaft and interchangeable basket (without any tools!), and others are more evolutionary like the redesigned strap and adjustment system.

Bottom line is that we feel sad when we go back to skiing the old CT1's. Is this pole for you? The only obstacle is the price. We guarantee you're going to like the pole. Whether it is worth the fantastic price, you have to decide.

Check out Swix's Triac Web Site: <http://swixtriac.com>
\$400
140-180cm lengths

SWIX STAR CT1

This legendary pole has won more World Cup events than any other pole and is 100% reengineered with improved stiffness and pendulum properties. With a Polycarbonate handle with natural cork in grip zone and Pro Fit strap in neoprene and nylon, the CT1 will be a favorite with racers and the performance-minded, even with the Triac stealing some of its thunder.
\$299

SWIX TEAM CT2

The CT2 has always been a great compromise of weight, stiffness, price and strength. It serves the sweet spot for performance skiers who want a great pole. The CT2 is slightly heavier and less stiff than the CT1, but it is stronger (breaks less easily), making it a favorite for junior racers and recreational skiers alike.
\$240

SWIX CARBON CT3

The CT3 is reinforced at the bottom to withstand ski edges and impact. It's a great all-around pole, roller-ski pole, or mass-start pole if you tend to get caught in traffic. Shares the same strap as CT1 & CT2, but uses a cork-filled thermoplastic grip. The CT3 is noticeably heavier than the CT2, but still a reasonably good racing pole. A great choice for juniors because of its strength and price.
\$170

SWIX CROSS CT4 WITH CLICK GRIP

The CT4 is a recreational/racing pole with a carbon/fiberglass shaft, cork-filled urethane handle and Swix's new Just Click Strap System. The Just Click Comfort Strap is released from the pole with a simple click of the thumb on top of the grip, providing the benefit of an advanced strap with the convenience of quick entry and exit so you can use your hands more easily.
\$90

SWIX COMP CT5

The CT5 is a value carbon/fiberglass pole with a polycarbonate handle and Pro-Fit Strap. This pole is a great value, providing the same high-quality Pro-Fit strap as the CT1. The shaft, grip and basket make it a bit hefty to sling around, but it is a high-quality pole that is good enough to do the job. Consider upgrading to the CT3 or CT2 if you are skiing 160cm poles or above.
\$70

FISCHER RCS CARBONLITE

The Fischer RCS Carbonlite poles have a new strap system that provides quick access without having to adjust the pole every time you take it on or off. In our testing, the 100% Carbon shaft is light and stiff, making the RCS Carbonlite a contender in the high-end pole fight. Available as kits that we can cut to size for you or you can cut and build yourself. 147g in the 145cm length.
\$299

V2 ROLLER FERRULES

Made from hardened carbide steel for durability. The 10mm ferrules (black) fit 9, 10 & 11mm shafts, the 8mm (Yellow) fit 7 & 8mm shafts.
\$17



SWIX

Swix Dominates Cross Country Events at Winter Olympics: 70% of all the gold medals awarded during the Cross Country Competition at the Vancouver Olympics were won by athletes using Swix poles!

SWIX COMPOSITE TECHNOLOGY

Swix is the leading innovator in the field of composite ski poles. Top World Cup athletes prefer Swix composite poles, and Swix is the natural choice for maximum performance regardless of skill level. This year we are introducing a new industry standard, Swix Triac 1.0! In addition well known models such as Star, Team, Cross and Comp have been reengineered with important improvements on technical properties such as stiffness and improved swingweight.

INTRODUCING SWIX TRIAC 1.0

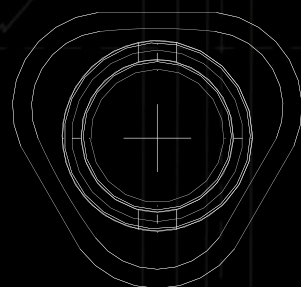
Swix has reinvented the XC ski pole and created the next generation of ski poles! Swix Triac.

The Swix Triac 1.0 is built with the most advanced materials and technology available today. Starting from scratch, we have utilized both internal and external resources; Swix racing service, world cup athletes, university research teams, and our own engineering department to develop the world's finest ski pole. Every detail has been thoroughly reviewed and tested before being placed into production.

When only the very best will do, there is no room for compromise.

SHAFT

- High stiffness and strength
- Super lightweight
- Ultimate swingweight



BASKET

- Interchangeable baskets for different snow conditions
- Lightweight
- Mechanical 3D/triple locking fixation systems (patent pending) (NO GLUE)!



SWENOR

DISTRIBUTED BY SWIX SPORT *Rollerskis*

WHY SWENOR? BECAUSE ROLLERSKIING SHOULD REPLICATE SKIING ON SNOW!

Swenor skis are famous for their feel of snow. They achieve this stature because Swenor engineers go to great lengths to develop frames, wheels and bearings that work together to make skiing on asphalt feel like skiing on snow. Swenor frames are lightweight, low and dampen harsh road vibrations. Swenor wheels safely run on precision sealed bearings and durably replicate the speed and feel of skiing on even the roughest roads.

MODEL 060-000 FIBREGLASS CAP



MODEL 060-000 SKATE ELITE



swenorsports.com

Kris Freeman USST



In our experience as athletes and as coaches for athletes across North America, we observe a huge thirst for cross-country skiing knowledge. The situation is improving with groups like NENSA and CXC working regionally to educate skiers and coaches, but still many people are working very hard, yet failing to achieve their potential simply because they lack crucial knowledge. Cross-country skiing is an incredibly technical sport and learning from an expert can dramatically shorten the learning curve.

Boulder Nordic Sport has a great line-up of camps, clinics and coaching options that offer an exciting way to rapidly improve your knowledge and ability. Our events and coaching programs generally focus on technique development with a strong emphasis on providing the information our clients seek about training, equipment and waxing. We help you learn how to balance your passion for the sport with real-life demands and get the most out of your skiing.



BNS TRAINING GROUP

December 1– March 1

Join BNS coaches in Boulder to ski once each week on snow, developing technique and fitness with like-minded skiers. Each workout has a technique focus and a training focus and is a great way to get consistent feedback throughout the season.

OSLO 2011 WORLD CHAMPIONSHIPS

February 24–March 1, 2011

Join BNS guides and see the spectacular show when Norway hosts the 2011 World Championships in Oslo. The famed Holmenkollen venue is receiving a multi-million dollar upgrade for this event and it should be a once-in-a-lifetime opportunity to see some fantastic racing and enthusiastic crowds.

WORLD MASTERS 2011

March 3–11, 2011

Hit the World Masters races in 2011 at Silver Star, BC with the support of a BNS service team taking care of the waxing details so you can focus on your races.

AUSTRIA SKI SELECTION AND GLACIER TRIP

June 2011

We will be bringing a small group of people to Austria to tour ski factories, check out the ski selection process and then spend 4 days in Ramsau, Austria testing skis on the glacier and playing in the beautiful mountain town. This camp will focus on the ski selection process, ski service and testing skis on the glacier. Participants will be able to test out a wide range of skis on snow and possibly buy the ones they like the most.

NEW ZEALAND ON-SNOW CAMP

July 18–24, 2011

The New Zealand on-snow camp immerses participants in the skiing lifestyle with 7 days of top-notch cross-country ski coaching on snow at The Snow Farm on the South Island. Daily sessions include extensive video analysis and are complemented by evening seminars on topics including training plans, technique, and waxing/ski prep. The New Zealand camp is a once-in-a-lifetime trip that drastically improves skiing technique and builds knowledge in an incredibly beautiful place. Escape the summer heat and improve your skiing!

SWEDISH VASALOPPET

March 2012

The Swedish Vasaloppet is the biggest cross-country ski race in the world and the BNS trip will pursue it in the grand style that this race deserves. BNS owner Nathan Schultz will lead the trip along with local support from Henrik and Magnus Eriksson. Henrik is a former winner of the Vasaloppet and will coach participants through the course, preparation, feeding and waxing for the big event.

This Swedish Vasaloppet trip has very limited space due to lodging constraints.

See BOULDERNORDIC.COM or call 877.BNS.SKIS to get more information about our camps, including registration, schedules, sample itineraries, photos and videos showing participants before and after our New Zealand Camp.



MORE INFO AND REGISTRATION AT
BOULDERNORDICSPORT.COM

BNS COACHING PROGRAMS

Take advantage of our decades of experience as cross-country skiing coaches to maximize the results of your limited training time. BNS offers four coaching programs that provide different levels of service to match our clients' needs.

The foundation of our coaching programs is a custom training plan developed for you based on your unique background and goals. Each package adds coaching resources to the plan depending on the level of support you want. Your coach can plan daily workouts for you, or you can plan daily workouts and have your coach review them and make suggestions. Whatever option you choose, you gain direction, focus and confidence that you are maximizing the results of your training.

TRAINING PLAN WITH FOLLOW-UPS

\$275 6 months \$350 12 months

TRAINING PLAN + DAILY WORKOUT REVIEW

\$175/month

TRAINING PLAN + DAILY WORKOUTS

\$250/month

TRAINING PLAN + DAILY WORKOUTS, PRIVATE TECHNIQUE LESSONS, PHYSIOLOGY TESTING, WORKOUT SUPERVISION, NUTRITION SUPPORT

\$499/month

“After not skiing for almost 20 years, it was great to have an advisor to guide me through all of the changes in the sport and help me set goals. Having a coach has helped me find the best way to balance my busy schedule and limited training time and has given me confidence that I’m doing the right things in my training. It is great to have someone to consult about everything from waxing and ski selection to nutrition and race strategy.”

–Joseph, New Mexico

WHY

If you are serious about skiing, you should be rollerskiing. Rollerskiing dramatically improves balance, upper body strength and technique making the transition to snow faster and easier. If you have never rollerskied before, you will be amazed at how much it helps with ski-specific technique and strength. And it's fun.

BNS staffers have put thousands of hours rollerskiing and we've tested every ski we sell, so we know what works on different roads, for different people and for different goals.

HOW

CLASSIC VS. SKATE Rollerskis, like regular skis, come in classical and skate versions. Skate Rollerskis have narrower wheels to roll on edge smoothly, while classical skis have wider wheels for stability and a ratchet to provide "grip" when kicking. Rollerskis are typically used to build specific strength, balance and technique.

Because classical ratchets give 100% kick regardless of technique, it is important to be diligent about technique when classical striding on rollerskis in order to avoid developing a late kick on snow. Many people avoid getting bad habits by just skating and double-poling on rollerskis. We recommend starting with a pair of skate rollerskis that allow you to do 90% of what you need to do: double-pole and skate. Classic rollerskis are best for classic-only skiers or serious skiers who want to train both techniques.

BOOTS & BINDINGS Normal winter bindings and boots are used with rollerskis. Alpina also makes a special rollerski boot that is cooler and lighter than the winter boot

(available by special order). Rollerskiing trashes boots a lot faster than normal skiing, so it is common to use separate boots for rollerskiing and winter skiing. Many people use boots for a winter, convert them into rollerski boots, then use new boots to hit the snow.

POLES & FERRULES Rollerskiing poles are the same as snow skiing poles with the winter baskets swapped for special rollerskiing ferrules that have hardened steel tips that grip asphalt and are more durable. Use the same length poles as you would in the winter.

Rollerski tips grip asphalt and dirt, but not concrete. The tips need to be sharpened regularly to provide adequate grip without slipping. The best way to do this is sharpen tips every time you go out - it only takes 30 seconds and it makes rollerskiing much more pleasurable. If you wait longer than one or two times between sharpening, the tips are too dull to easily sharpen. See page 44 for our selection rollerskiing ferrules.

SHARPENING TOOLS

Diamond sharpeners are best for sharpening the extremely hard steel on rollerski tips.

COARSE GRIT

For regular maintenance and final sharpening

EXTRA COARSE GRIT

For rapid removal of material when tips are dull.

DMT MINI-SHARP DIAMOND SHARPENER

Lightweight and ultraportable stone for sharpening anywhere. Throw one in your water bottle carrier or attach to a keychain.

Coarse grit \$12

Extra Coarse grit \$12

DMT 2-SIDED DIAMOND SHARPENER

One side coarse, one side Extra Coarse. Folds into a butterfly-style case and has a larger sharpening surface than the mini-sharp.

\$45

SWENOR SKATE ELITE MODEL 065-200

Famous Swenor on-snow feel from a composite shaft and skate wheels. The composite shaft dampens road noise and gives ski-like flex.

\$310



SWENOR SKATE MODEL 065-000

Lightweight Skate: Stable, lowered Aluminum Monocoque Frame and Swenor famous on-snow wheels. This is a light, solid rollerski for those who like a stiffer, lighter shaft than the Skate Elite. Especially good for heavier skiers and high-intensity training.

\$285



SWENOR CLASSIC FIBERGLASS CAP MVP

Composite shaft gives snow-like feel. Lightweight front and rear aluminum wheel forks are attached to the exterior of composite shafts. This three-part shaft fork system further isolates the skier from harsh road shock.

\$310



SKI*GO CARBON 335 SKATE

The new Carbon 335 has a carbon shaft that dampens road noise and gives realistic on-snow feel. Stiff and light. Straight fork gives a higher stance, but very stable.

\$340



SKI*GO CARBON 780 CLASSIC

The new Carbon 780 uses a relatively long, cambered carbon fiber shaft to give the most realistic snow-like feel of any classic rollerski. It dampens road noise well and gives the skier feedback for proper timing of the kick.

\$340



V2 XL98 CARBON SKATING

The XL98 combines a composite shaft with V2's many unique options such as a brake and speed reducers. The carbon shaft is stiff and lively, dampening road noise well. Wheels are solid rubber and medium to medium-slow speed.

\$349



V2 98SL SKATING

The 98SL uses an economical aluminum shaft with the same fork and wheel as the XL98 to give an inexpensive alternative to the composite rollerskis. Speed Reducers available.

\$240

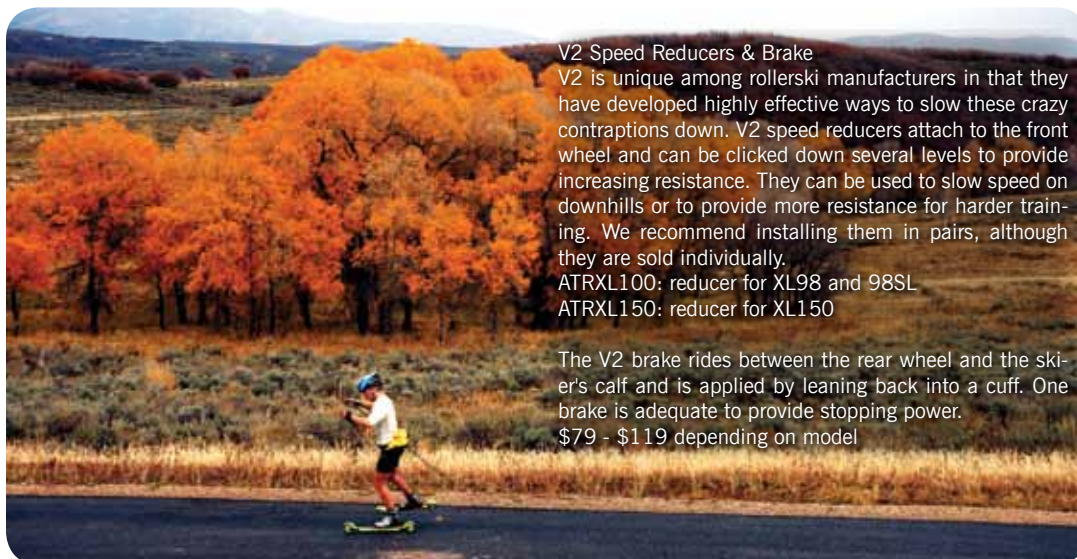


V2 XL150 SKATING

The XL150 uses larger diameter pneumatic (air-filled) tires to provide the unique capability to handle rough roads or smooth dirt paths. It offers great benefits to those who are challenged by chip seal or rough roads.

The disadvantage is that this ski is a little heavier and loses some snow feel. Aluminum shaft, accepts speed reducers and brake, wheel speed is fast to medium-fast.

\$349



V2 Speed Reducers & Brake

V2 is unique among rollerski manufacturers in that they have developed highly effective ways to slow these crazy contraptions down. V2 speed reducers attach to the front wheel and can be clicked down several levels to provide increasing resistance. They can be used to slow speed on downhills or to provide more resistance for harder training. We recommend installing them in pairs, although they are sold individually.

ATRXL100: reducer for XL98 and 98SL

ATRXL150: reducer for XL150

The V2 brake rides between the rear wheel and the skier's calf and is applied by leaning back into a cuff. One brake is adequate to provide stopping power.

\$79 - \$119 depending on model



BOULDER NORDIC SPORT

Natron Nordic Enterprises, LLC
1717 15th St
Boulder, Colorado 80302
USA

+1 720.227.9400

877.BNS.SKIS Toll Free

(877.267.7547)

866.371.0631 Fax

bouldernordicsport.com

mail@bouldernordic.com

BNS EAST

200 Anderson St, Suite 5
Portland, Maine 04101

+1 207.541.7438

bnseast@bouldernordic.com

BNS MOBILE

At Events Near You

+1 303.656.3886

bnsmobile@bouldernordic.com

**WIN FREE GEAR!
OVER \$12,000
IN PRIZES**

BOULDER NORDIC SPORT's

bi-weekly prize drawings begin in October. We have over \$12,000 in prizes to give away, so register today at bouldernordicsport.com for your chance to win!

Prizes from Fischer, Salomon, Rossignol, Holmenkol, Ski*Go, Madshus, Craft, Swix, and BNS.

For contest details, rules and registration, see

bouldernordicsport.com

To lessen our environmental impact, we printed this Guide on 30% post-consumer waste recycled paper in conjunction with independent outdoor retailers across the country. This saves resources throughout the process. Enjoy, then please pass along your copy or recycle it.



BONOCO

BNS GOES MOBILE

This winter, the BNS Mobile Service Rig hits the road, pushing our goal of "World Cup Service for Everyone." At events across the country, BNS mobile allows us to provide race waxing services and our mobile store front showcasing wax, tools and other great gear. We can do a better job testing wax and you can get the fastest wax of the day at the race site.

BNS RACE SERVICE CALENDAR

Below is a sample of races that will have full BNS Mobile support. While your competitors stress about which wax to use, where to get it and how to apply it, you can relax after you drop off your skis with our professional service crew. Like a World Cup racer, you'll pick up your skis race-ready with the best wax and structure applied so you can focus on your race.

Want to do your skis yourself? No problem. Drop by BNS Mobile, ask us about our test results, get advice and grab whatever wax you need at our mobile store.

EVENT	DATE	LOCATION
West Yellowstone Ski Festival	11/21/10–11/28/10	West Yellowstone, Montana
Noquemanon	1/29/11	Marquette, Michigan
Craftsbury Marathon	1/29/11	Craftsbury, Vermont
Alley Loop	2/5/11	Crested Butte, Colorado
Boulder Mountain Tour	2/5/11	Sun Valley, Idaho
City of Lakes Loppet	2/5/11–2/6/11	Minneapolis, Minnesota
UVM Carnival/Eastern Cup	2/5/11–2/6/11	Stowe, Vermont
Mora Vasaloppet	2/13/11	Mora, Minnesota
American Birkebeiner	2/26/11	Hayward, Wisconsin
Masters World Cup	3/3/11–3/11/11	Sovereign Lakes - Vernon, BC

We raised the bar in wax testing and recommendations in 2009–2010 by testing multiple brands of wax and testing at a professional level, using the same methods we use to test skis in our work as technicians at World Cups, World Championships and The Olympics. One of the things that most excites us about our new mobile setup is that it enables us to do more on-site testing and provide more feedback on waxes, grinds and ski flexes. The direct benefit will be an increase in quality and quantity of our wax recommendations as we continue to push the standard higher.

Go to BOULDERNORDIC.COM for a complete schedule of supported events.