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BRINGING WORLD CUP SERVICE TO EVERYONE



EASTERN SATELLITE STORE

HOLMENKOL®

SKI*GO

BOULDER
NORDICSPORT

NEW



THE MEN'S 15KM CLASSIC AT THE 2009 WORLD CHAMPIONSHIPS.

A LITTLE PANIC CAN BE GOOD

BY: NATHAN SCHULTZ

When I launched BNS in 2006, I had a vision of what it could become, but some of the ideas seemed so outrageous that they could only be part of an unachievable fantasy. After three years of hard work building BNS, I realized that what we are trying to accomplish is really quite simple: make our technical sport more fun and accessible by sharing our knowledge, experience and passion for what we love to do. Keeping to that ideal has helped us help you, our customers, enjoy the sport and therefore has made BNS a success.

I had the privilege of working with the US Ski Team at the World Championships and Lahti World Cups in February and March. In the final minutes before the men's 15km World Championship, I had finished all of my glide wax testing and was coming over to help with final kick wax preparation. It was absolute pandemonium with every team racing around trying to deal with the changing conditions as fresh, dirty snow was falling right around freezing. I realized at the time that it was probably a historic moment, and I guiltily stepped back and snapped this picture of Kris Freeman and the US Ski Team waxers as they made the final call on skis. Kris took those skis and threw down one of his best races ever, ending up fourth, mere seconds away from a medal.

The frantic intensity, focus, and nervous fear you see on everyone's faces in that image exemplify our busy off-season here at BNS. In September we launched a satellite location in Portland,

Maine to better support our large Eastern customer base. BNS will also be importing Holmenkol and Ski*Go wax lines, bringing a direct-to-consumer business model to two superb product lines that we have used extensively in North America and on the World Cup. These two wax lines will allow us to expand our service in the field and this new business model will significantly reduce prices and increase the accessibility of high-level wax and tools. Additionally, we have a new stone grinding menu as a result of the development and testing work Zach Caldwell has been doing as part of the US Ski Team's Olympic Development Program.

Finally, and what I think is actually the most important development, we have added a network of new staff that form what I consider to be the Cross-Country Dream Team. Zach and Amy Caldwell have moved to Boulder to join Shawn Delaney, Eric Pepper and me as the key Boulder personnel. Roger Knight joins us to launch BNS East in Maine, while Randy Gibbs, Ben Husaby and Eric Jensen will join us as tech reps at key events around North America this winter. This body of knowledge and experience is simply not found anywhere in the world and we know that you will be impressed working with anyone on this team. The energy and excitement of having this group together is already generating new ideas that will certainly continue pushing BNS to surpass my far-fetched dreams in the years to come.

This year's BNS magazine focuses on the evolution of our vision: World Cup Service for Everyone. We are newly equipped and energized with the knowledge and infrastructure to help everyone achieve their goals in skiing, whether they are to go out and have fun a snowy field, win a national championship, finish your first ski marathon, or battle your friends at the Birkie.

You will see a lot of images in this mag from my trip to the World Championships in the Czech Republic. Aside from the rewards of being involved with a highly-motivated and professional service team, it was an incredible experience to witness and contribute to an historic World Championships for the US. Kris's 4th place, watching my friend and former teammate Bill Demong win the Nordic Combined title, and being in the stadium to see Kikkan Randall win silver in the sprint were all emotional highlights of an amazingly informative and educational trip.

But aside from those results, the most memorable part of the trip was being immersed in a crazy mob of cross-country skiing fans screaming, waving flags and generally having a lot of fun. There were several moments when the skiers were battling it out on the trails and the energy from the crowd was so intense it made the hair on the back of my neck stand up. It is something that I hope my five-year old daughter will get to see in Oslo 2011.

Have fun this winter, and we hope you enjoy this sport as much as we do.



BNS STAFF

ROGER KNIGHT & BNS EAST



Roger Knight has been around competitive cross-country skiing his whole life. A state champion in Maine in high school, he raced for UNH. Roger went to work at Swix after college and soon went from part-time waxer to US Race Director and Nordic Product Manager. After six years on the road working with top clubs and the US Ski Team in this position Roger decided to get off the road and return to his home state of Maine. For the last five years Roger has worked on importing Ski*Go wax into the US and re-establishing Ski*Go as the top brand that it is in other parts of the world. As part of his lifelong devotion to the sport, Roger enjoys making sure that each and every skier is as educated as they can be about equipment and the nuances of waxing. Roger manages BNS's Portland, Maine location, the two wax brands, and Team Sales.

Roger opened BNS East in September at 200 Anderson St, Suite 5 in Portland, Maine. The BNS satellite store brings together the knowledge and experience of the BNS Team for Eastern customers. With the same product selection that we have in our Boulder store, BNS East will be a the place to go to find the best equipment and fit in the East.

We will not be stone grinding skis at the Portland shop, but we will offer \$10 round-trip shipping for skis dropped off there, making it easier and much less expensive to grind skis. Additionally, Roger and the Portland shop are the center of our wax distribution, and will serve as a tremendous resource for wax as well as knowledge and support to help you choose and use waxes with confidence.

NATHAN SCHULTZ

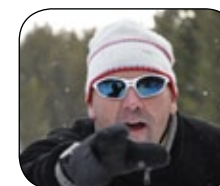


Nathan Schultz began skiing in high school where he finished dead last in every race. His friends' enthusiasm for the sport was contagious, however, and kept him going long enough to ski at the University of Colorado, where he was a two-time NCAA All-American, Team Captain and 1994 Scholar Athlete of the Year. He went on to a 15-year professional career with the Subaru Factory and Fischer/Swix Teams while also building a software consulting business and racing mountain bikes professionally from 1995-1999. He launched BNS in October, 2006.



SHAWN DELANEY

The front of the store at BNS is Shawn's domain. Years of retail and XC experience from launching the Skinny Raven in Anchorage to managing Nordic operations at both Snow Mountain and Devil's Thumb Ranch in Colorado give him a unique perspective on the sport. He has also been race director for the Colorado International Spring Series and the Anchorage Nordic Ski Club. He understands the needs of both the novice and the highly tuned skier. We at BNS believe Shawn thinks the internet is just a fad that will soon pass.



BEN HUSABY

Ben joins BNS this year as a Technical Guru and Field Rep. Ben's personal ski resumé includes multiple Olympic and world championship teams, as well as a long list of Domestic victories. After retiring from racing, he threw his passion into coaching and continues to produce world-class results as Program Director for The Bend Endurance Academy in Oregon. He has been the head coach in Bend since 2000 and has stints coaching at World Junior/U23 Championships, National Elite Group and as the PNSA divisional Head Coach 2001-2009. He brings his tremendous experience to BNS to help educate and deliver wax, equipment and stone grinding information to the public and to BNS. He will be testing waxes and grinds at major championship events in the US and abroad as well as at regional events in the Northwest.

ZACH CALDWELL



Zach Caldwell graduated from Middlebury in 1994 where he was twice captain of the Nordic Team. He began work for the fledgling New England Nordic Ski Association and grew NENSA for six years, working on regional development programs and coaches education tools. In 2001 he left NENSA to start Engineered Tuning – an elite Nordic grinding service that has evolved through time and has now been wholly absorbed by BNS. Zach spent the last two years testing grinds at the Callaghan Valley Olympic venue for the US Ski Team as part of their Olympic Development program. In addition to working with skis, Zach works as a personal coach with a small number of high level American and Canadian athletes including Kris Freeman. Zach will be leading BNS efforts in ski selection, grind development and waxing.



AMY CALDWELL

Amy's athletic career carried her through NCAA division I skiing and into triathlon where she became two-time World under-24 Triathlon Champion. Her extensive coaching experience in the cross-country ski world includes 12-years at Stratton Mountain School, World Junior/U23 Coach for US and Canada 2007 & 2009, and the last two years as the Head Coach for the Callaghan Valley Training Centre, a National Athlete Development Centre based out of the 2010 Olympic venue. Amy adds her experience to the BNS crew and takes care of much of the business management.



ERIC PEPPER

Eric has been with BNS from the start and enters his fourth year at BNS and 8th season as the head coach of the Boulder Nordic Junior Racing Team. Skiing is his focus 11 months each year with a summer schedule of ski camps, daily training activities, and planning. Pepper began racing at the age of 4 and continued on through college at St. Lawrence University. Eric brings experience to the table having coached top-level juniors, kids just out for fun, and a wide array of masters. He brings his all-around knowledge of the sport to BNS each week to help customers, fill orders and prep skis to perfection.





BNS SKI SERVICE REGIME

BNS FLEET MANAGEMENT

1. SKI SELECTION

- EVALUATION OF EXISTING SKIS
- IDENTIFY NEEDS BASED ON PREVAILING CONDITIONS & EXISTING FLEET
- PLANNING & NEW SKI SELECTION

2. FLEET SET UP

- EVALUATION OF SKI FLEET CHARACTERISTICS
- GRIND SELECTION

3. RACE WAXING

- TESTING PRACTICES
- BASE CONDITIONING & PREP
- RACE UNDERLAYERS (PARAFFINS)
- FLUOROCARBON POWDER WAXES

BNS SERVICE SUPPORT

4. OPTIMIZATION

- HAND STRUCTURE
- FLUOROBLOCK & LIQUID WAXES

Our goal with this year's BNS magazine was to present the wealth of information we've learned on the World Cup, in our shop, and out on the trails. While much of this is technical, we hope that we have simplified the process and show you how you can achieve the highest levels of performance with your equipment. We're happy to share



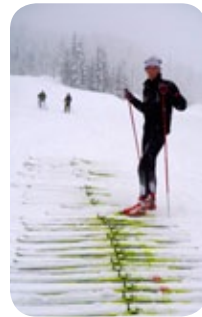
information, but we also want to simplify skiing to whatever level makes you comfortable.

We are ski geeks so you don't have to be. At the World Cup level, we are trying to milk every last millisecond of speed, but we also reveal the most important aspects of the process so that you can focus your efforts on getting 99% there without having an unlimited budget and a team of 5 wax techs supporting you.

BNS has established itself as the leader in the North American market selecting and stone grinding skis. We have continued to improve ourselves in these areas; we're excited to offer new grinds from the USST Olympic Development project and we've selected the best inventory of race skis ever assembled on the continent. But we've also stretched ourselves in some new directions this year with the addition of the Holmenkol and Ski*Go brands as our in-house wax lines, and with further development of the Finite Finish structure tool.

In practical terms there are two major categories of ski preparation. The one we have focused on most in the past is what we call fleet management, and it includes pretty much everything prior to race day. Evaluating existing skis, selecting new skis, and setting up everything with appropriate grinds – all of this is fleet management. But having a well selected and set-up fleet doesn't guarantee you good skis on race day – this is where race service takes center stage, and it's where most skiers find themselves flying solo in a world with a bewildering array of options.

At BNS we have assembled a crew of race service technicians with a fantastic wealth of experience. Nathan and Zach have both done World Cup race service work with the US Ski Team. Roger has six years of experience as the race service



director for Swix prior to picking up the Ski*Go distribution for the US. Amy has fourteen years of experience coaching, first at Stratton Mountain School, and then at the Callaghan Valley Training Centre based in Whistler. Amy has had a range of experience, from the club level up to the World Cup level. Eric has a lot of practical experience as a junior coach working with real-world considerations. Together we have developed a range of product offerings and informational support to help improve your race day experience.

BNS RACE SERVICE SUPPORT

On race day the most important priority is to make sure your skis are "in the race". Going for a big advantage before ensuring that your skis are competitive can lead to disaster. Good basic practice in wax selection and application can help to ensure that you don't put yourself at a disadvantage. Once you have ensured that your skis have an appropriate level of base conditioning and preparation, an appropriate race paraffin application, and an appropriate top-coat, it's possible to try for some advantages.

On the World Cup we always use top-coat optimizations. Once the base wax and fluoro powder are selected, we look for ways to improve the performance of the skis. This involves testing hand structure and fluoroblock or liquid fluoro applications (see page 12). It is rare that the basic preparation is not improved by these methods, and the selection of the best optimizers can make an astounding difference.



Most waxers recognize the value of keeping things simple, and racers who wax their own skis recognize this as a necessity. At the same time, everybody wants the best out of their skis on race day. Given the limitations that you face in testing on a race day we are convinced that your time and money is best spent pursuing a strategy of simplicity in paraffin and fluoro powder selection, and focus available resources on optimizing that setup with fluoroblock applications and hand structure. It's a lot to bite off without support, but we're here to help you select the best available products and develop some simple testing strategies that can put World Cup quality race service within reach.



BOULDERNORDICSPORT

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The leaders attack during the men's 30km pursuit. Liberec, 2009



BNS has one of the largest selections of XC skis in the country. If we don't have the perfect match for you in our inventory, we hand-pick them for you directly from the warehouse.



Hand Selecting Skis

World Cup skiers find the best skis by putting many, many skis on the snow. Most of our customers don't have that luxury, so we have to do better work on the initial selection. We hand-select our top-model skis at the manufacturers' factories in Europe and US warehouses so that we can be certain all of our inventory meets our high standard of quality.

Our flex testing equipment and experience allow us to assess factors such as fore-aft load distribution, bridge shape, pressure distribution, camber action, finishing hardness and overload response. This data provides detailed insight into a ski's handling and performance and allows us to not only determine if a ski is "good", but also match the ski to the strengths and demands of a particular skier and targeted conditions.

Each individual cross-country ski has a unique flex pattern that interacts with the snow and the skier to determine stability, speed, acceleration and liveliness. Fitting a ski correctly to the skier and the snow conditions contributes far more to a ski's overall performance than structure, wax and base material combined. That is why at BNS we take a scientific approach to evaluating ski "flex", correlating on-snow characteristics and

performance to factors we measure on our custom ski testing equipment. We combine feedback from hundreds of elite athletes, thousands of master skiers, juniors and coaches, as well as our own testing to find out what is working in the real world and correlate it to our ski tests off the snow.

SKI SELECTION: a comprehensive process of first evaluating the overall quality of the ski, followed by matching flex characteristics to a specific skier and targeted conditions. In our experience, good quality skis will perform well in broad ranges of conditions if matched to a skier's weight and skiing style. So the first priority is to identify great skis. The way a ski reacts to different loads determines how it will perform on snow. We empirically test skis on our flex tester by applying varying loads on the ski and observing the resulting camber profile and pressure distribution. We can then correlate these flex characteristics to on-snow performance based on our experience and testing.

CAMBER PROFILE: The shape of the ski arc above the snow is called camber and by measuring the length and shape of the camber with different forces applied to the ski, we learn a lot about how a ski will handle, and we get very precise information for identifying the kick zone on classic skis. We can clearly establish where each layer of wax should be applied

ROGER AND ZACH CHECKING OUT NEW SKIS



"You haven't had fun skiing until you've been on a great pair of skis"

and give the skier great information about how to adjust their wax pocket under different conditions. It may not seem like a big deal, but having this information is surprisingly valuable and makes kick waxing much easier. The kick zone map provides clear guidelines to make educated decisions on where and how to apply kick wax instead of relying upon trial and error.

PRESSURE DISTRIBUTION: HOT VS COLD

The relative concentration of pressure at the ski's contact point greatly affects the frictional forces as well as what is commonly referred to as "suction" with moisture in the snow. A highly focused area of pressure is a "hot" ski which implies that the ski may be slower to accelerate at low speeds, but have higher top speed and better acceleration at high speeds. Hot skis also tend to deal with moisture effectively as the water is "pushed" out of the way of the ski, instead of allowed to roll along the bottom of the ski creating static friction. A ski with cold (spread out) pressure distribution will feel "slippery" since it accelerates faster due to lower static friction.

ACTIVITY: We can quantify how "active" a ski is by measuring the difference in camber height between low and high loads. Typically, this is done applying half of the skier's weight and then the skier's full weight. A ski that has dramatic differences in camber height of these two measurements suggests a lively, springy feel, whereas a low differential suggests a "flatter" and "deader" feeling ski, which is often quite stable.

For classic skis, an additional activity measurement gives us one of the most important signs of a ski's quality. A soft "finish", or how much energy it takes to go between the initial point where the kick wax engages to where it is completely engaged, is a very desirable characteristic. Almost universally, great classic skis have a soft finish.

FLEX MATCHED TO SKIER & CONDITIONS

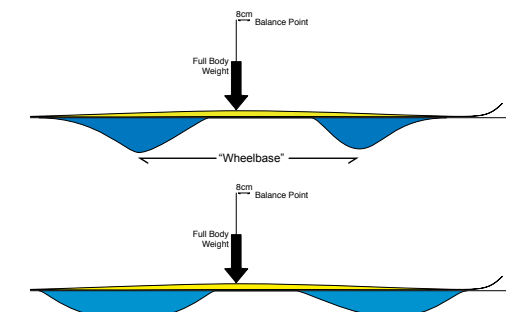
BASE MATERIAL

BASE STRUCTURE

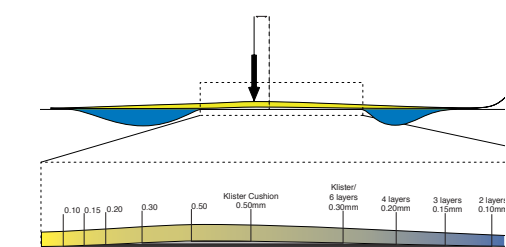
WAX



How Ski Flex Influences Performance



"Hot" pressure distribution above, "cool" pressure distribution below.



Defining the kick zone on a classic ski is simple and precise with a flex tester

Ski Flex Glossary

CAMBER: The shape or profile of a ski viewed from the side. Higher camber generally corresponds to a stiffer, livelier feel.

LOAD DISTRIBUTION: How and where along its length a ski transfers downward forces to the snow.

BRIDGE: The area in the middle of the ski between the two contact points with the snow. Bridge shape affects stability, influences load distribution and determines the kick characteristics in a classic ski.

PRESSURE DISTRIBUTION: How the downward force is spread across the contact zones of the ski. Influences acceleration, glide, stability and frictional forces.

FINISH: Soft finish means that a classic ski has lower resistance during the last bit before it closes, while hard finish requires more energy to complete the close.

BNS Fleet Management: Optimizing Your Skis

We start by evaluating skis on the flex tester to see if they are fit appropriately then we identify the ideal snow/track conditions for the skis and what stone grinds will produce the best results. Once we have assessed existing skis, we can guide you to choose the skis that will benefit you the most given your existing fleet, where you live, and the predominant conditions where you ski.



GRIND DEVELOPMENT

When Zach got his first Tazzari machine in 2002 he received formulas for several solid, well-proven grinds. He began offering those grinds to customers immediately, but also started tinkering. Within his first year of operating a grinder he produced the Z40, a grind which changed a lot of perceptions of what a grind can be.

It's never been in our nature to leave well enough alone, and in the past eight years we have tested literally hundreds of different structures. In the past two years the pace of our testing and development has accelerated with Zach's involvement in the USST 2010 development project. Zach was stationed at the 2010 Olympic venue and his primary job was to test skis, wax, structures and generate technical advancements that will help USST athletes win medals.

Grind development and testing is a two-part process. Development is a theoretical process that includes daydreaming and tinkering to generate grind concepts worth testing. Testing is the experimental process of putting those theoretical concepts on the snow, and it involves a lot of time and energy prepping skis followed by skiing up and down a hill. There is no development without testing, and there is no testing without development.

BNS '08-'09 TESTING BY THE NUMBERS

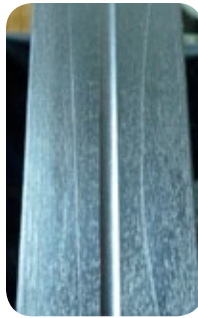
- A. NUMBER OF DIFFERENT GRINDS TESTED: 75
- B. NUMBER OF SPEED TRAP TESTS OF GRINDS: 38
- C. MOST PAIRS IN ONE GRIND TEST: 19; AVERAGE FOR EACH TEST: 10.6
- D. AVERAGE NUMBER OF MAN-HOURS SPENT PREPPING AND PERFORMING A TEST (NOT INCLUDING DRIVING TIME): 7
- E. MAN-HOURS SPENT TESTING GRINDS: 266 (6.65 WEEKS OF FULL-TIME WORK)
- F. NUMBER OF GRINDS THAT WON A TEST: 14; NUMBER THAT WON MORE THAN ONE TEST: 7
- G. NUMBER OF SPEED TRAP TESTS OF WAX OR HAND STRUCTURE AT COMPETITIONS (WORLD CHAMPIONSHIPS, WORLD CUP & NOR AM): 40
- H. MOST KM SKIED IN THE 100M TEST TRACK BY NATHAN IN ONE DAY AT WORLD CHAMPIONSHIPS: 43; TOTAL KM FOR 10 DAYS: 200
- I. DOLLAR VALUE OF PURE FLUORO APPLICATIONS USED IN TESTING (ESTIMATED): \$6000

Testing gets a lot of lip-service but very few stone grinders are able to test as much as they'd like because it is so time consuming. Conducting a grind test in controlled circumstances consumes all of a day's work if it's done well. Testing by feel is valuable and necessary, but the only way to get useful hard data is to test in a speed trap. Speed trap testing is boring in and of itself. It is doubly frustrating because the outdoors is hardly a controlled laboratory – conditions are constantly changing and test data frequently end up being questionable because of high variance. We have developed a testing protocol with some basic statistical analysis that has helped us to quickly assess the significance of a given test one variable at a time. This protocol helps as it gives us quick feedback on whether the test we are running is meaningful, but it is still a lot of work.

Speed trap testing is a local phenomenon and the results are useful for the conditions and the location of the test itself. For a grind to "make it" it must first demonstrate merit in our own controlled testing. Once it has proven itself in our testing we release it in limited circulation to some of the racers we work with who can test it in race situations around the continent and compare it directly to other grinds.

The fact is that snow varies a lot, even around a short loop on a 5km course, and the best structure is the structure that goes fastest around the whole loop, not just the 100m test portion. Every test teaches us more about how variables on the ski react to variables on the snow. Even a failed test gives us information and allows us to tweak patterns and textures we know work well into new theoretical models. We are very excited about our new grind menu for 2009-2010 and we look forward to getting your feedback on our new structures..

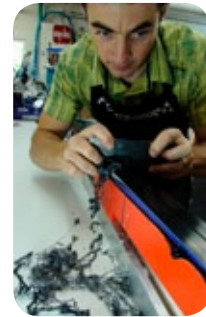
THE PROCESS



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 2-5 passes with an aggressive structure to remove imperfections created by the hand work.



STEP 2: POLISH. Next skis are "blanked" or "polished" using 4-10 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) and heated to 50°C for 8+ hours to increase wax penetration.

STEP 6: HARDENING. Once the skis have cooled, the bases then need to be hardened to keep snow crystals from penetrating the base and slowing the ski down. We scrape the saturation wax off and apply another layer of wax that is harder and then put them back in the hot box at 60°C for 2 hours. After this, the ski is ready to hit the snow.



NEW 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	ZR1	★	★
	Q1.3		★
	3/3		★



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

How to get it done

1. YOU HAVE THREE OPTIONS TO GET YOUR SKIS TO US:

- A. Drop them off at one of our shops in Boulder, CO or Portland ME.
- B. Drop them off Nov 23–28, 2009 in West Yellowstone @ 415 Yellowstone Ave
- C. Ship them to us in Boulder, CO. Please DO NOT ship skis to Portland, ship them directly to our Boulder location.

2. IF SHIPPING SKIS,

Download a stone grinding work order form from the "Ski Service" page at BOULDERNORDICSPORT.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.

3. CALL US IF YOU NEED HELP

With grind choices or any other questions. There is lots of information about our grinds and the process at BOULDERNORDICSPORT.COM.

NEW 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 bouldernordic.com.

NEW FOR 2009-2010

LI2 & LI3 – Our standby classic linear structures, LJ02 and LJ03, were given to us by Lars Svansson along with our first Tazzari machine in 2002. Over time we've tinkered with these grinds, but we have always come back to their simple linear patterns. In the past two years as part of the Olympic testing project, extensive testing on variations of the production parameters on these grinds led us to develop a superior surface texture. These new structures are a small evolutionary step from the LJ grinds. But these are, well, better.

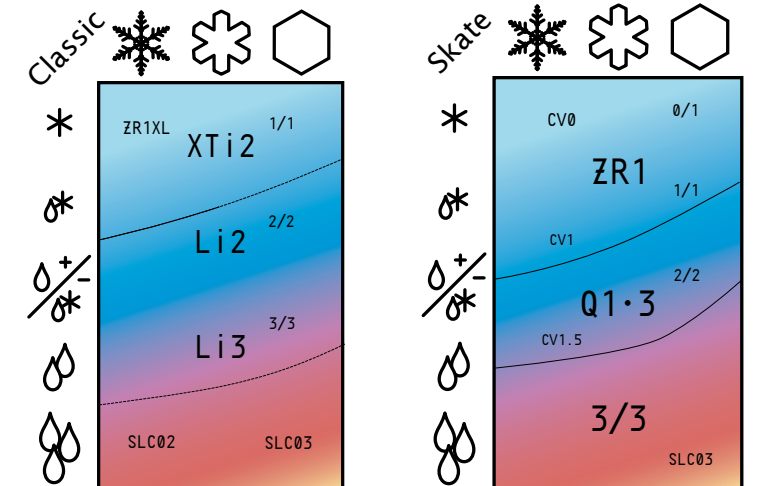
XTI2 – XTI2 is like our old XC02 but with bands of structure removed, providing "bridges" to keep the structure above the surface of the snow pack. More flat base material and superior aeration means better cold snow performance.

0/1, 1/1, 2/2 & 3/3 – This line of structures has been adapted from US Ski Team World Cup structures to be more applicable to North American conditions. These are multi-pass compound structures with a relatively shallow but faceted texture. In North America these grinds particularly shine in older crystals or man made snow.

CV SERIES – Our new "Callaghan Valley" series grinds have been developed as part of the Olympic project in response to the uniquely challenging new snow conditions that we regularly face in North America. Compared to Europe our snow demands finer grinds and smoother textures. The three new CV grinds saw plenty of racing action on the Nor Am and Eastern Collegiate circuits last season with excellent results. While the CV0 is less well established than ZR1 we're confident that it will assume a central role as a go-to cold structure.

ONE PAGE IS NOT ENOUGH

See BOULDERNORDICSPORT.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 expansive. Check it out.



Classic

Skating

This middle section of the magazine is dedicated to Ski Service – what needs to be done to the skis once they leave our shop. We start out with a basic overview of waxing, and then discuss race waxing, including tips on testing skis in the field and how to optimize skis on race day with hand structure and top coats. From there we move to some of the waxes and tools we have in our kits, explaining how we use them and why we chose them. We then have the Holmenkol and Ski*Go catalogs highlighting the best products from each line.

Our goal is to help you make the right decisions and take advantage of our experience in the field. We can tell you what works, what you need in your kit, and when to use it. We have, and always will be, brand-neutral. We know you don't want junk in your kit, and you won't find us talking about how Team X uses exclusively Brand S or T. That is just not reality, and we know that we will be successful telling you the truth about wax and equipment. We sell what is good from all brands, and we know what works because we are out there testing wax - every brand of wax - in races across the country and around the world.

We are confident in Holmenkol and Ski*go, because they work and they get chosen regularly in our work on the World Cup and in North America. But if something else is faster, we will tell you that and we won't sell you the second or third-fastest wax in our tests. That is why you can get waxes from every brand from BNS.

The one big advantage we gain by importing Ski*Go and Holmenkol and selling direct is that we have been able to significantly lower prices, making racing waxes much more accessible. These brands stand head-to-head or are superior in quality with all other brands, and we can offer them at much lower prices per application.

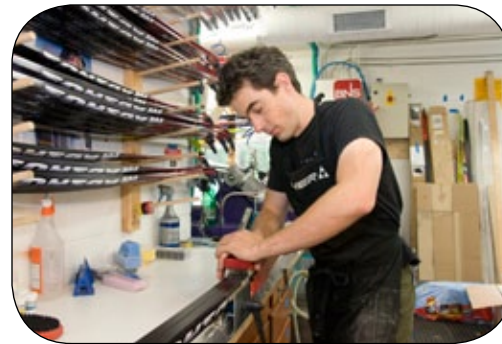
VISUAL WAX GUIDE

GO TO BOULDERNORDIC.COM TO SEE VIDEO OF THESE STEPS.

Waxing should be quick and easy. Get the right tools and go to work and you should be able to wax a pair of skis in less than five minutes.

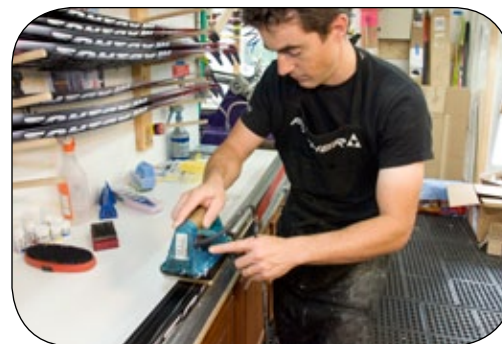
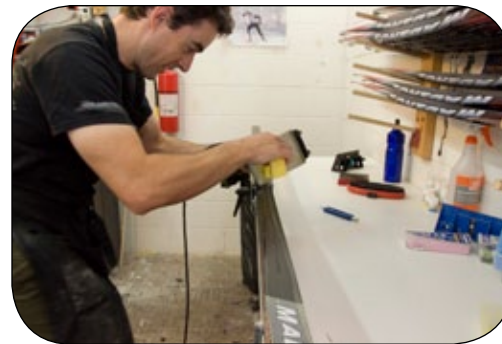
STEP 1: CLEAN AND PREP

Clean the ski and open the base for waxing by wiping with a glide wax cleaner (NOT kick wax solvent!) or doing a hot-scrape and then brushing with a metal brush.



STEP 2: WAX

Drip the wax on in a bead, then melt it in with quick passes from tip to tail. Three passes is plenty, don't overheat.



STEP 3: SCRAPE

Start with a good groove scraper and clean out the groove, then use a plastic scraper to clean the edges.



Use a sharp plastic scraper to peel off large strips of wax. Don't worry about getting every last molecule off the base; that is what brushing is for.

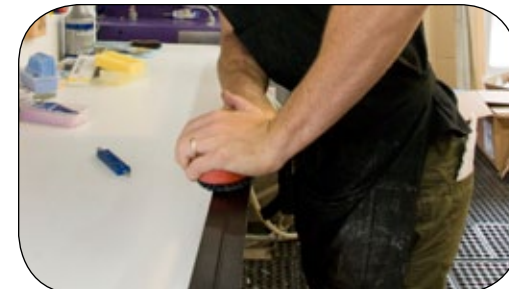


STEP 4: BRUSH

Depending on the hardness of the wax, different brushes are used. For harder waxes, soft steel or bronze brushes are ideal first brushes; for warmer, softer waxes, a stiff nylon brush is best. Brush from tip to tail until you get a consistent, shiny surface.

STEP 5: POLISH

The final step is to polish the wax and mechanically harden the final layer. Generally a stiff nylon brush is used for harder waxes, and a soft blue nylon brush for softer waxes.



WAX BASICS & BASE CARE

A discussion of the basics of waxing necessarily begins with a discussion of base material and its capacity to be modified by wax. Good basic maintenance of the ski base will ensure good quality base material, and is the most important thing you can do to ensure that your skis stay fast once they've been selected and stone ground. To do good work on your skis you need good tools. A wax iron should have excellent temperature control and a thick enough base to ensure relatively little variation in temperature during heating cycles. Scrapers and brushes should be kept sharp and clean. Waxing should not take a lot of time – if you find yourself spending hours working on your skis it is likely that you're doing as much harm as good.

We've posted videos and more information on ski prep and wax application techniques at bouldernordic.com

BASE BASICS

The base material of most skis is made of sintered ultra-high molecular weight polyethylene (High Performance Polyethylene, HPPE), a self-lubricating industrial thermoplastic used in applications requiring low friction and high abrasion resistance. Its common trade name is P-Tex. P-Tex is made by mashing minute particles of HPPE together under high pressure, forming a matrix of crystalline HPPE surrounded by amorphous zones of lower-density plastic and additives. HPPE itself is non-porous and does not absorb wax, but when wax is applied with sufficient heat and duration, it is absorbed into solution in these amorphous zones. Most base formulations require an iron temperature of around 110 degrees C to absorb wax. Alternatively wax can be absorbed slowly over a long period of time at a much lower temperature in a heat box.

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. Wax additives such as fluorine, graphite or molybdenum provide additional performance benefits. Wax only has a lasting effect when it is absorbed into the base. Damage to base material prevents wax absorption by essentially sealing off the path for wax to enter the base. This can be caused by overheating, which melts the HPPE together, hardening caused by prolonged exposure to air or clogging with dirt, among other things. HPPE is basically impervious to oxidation, but people (including us) generally say that a base is "oxidized" when describing the white regions of dried-out base that have been abraded by the snow due to lack of lubrication. Even with extreme care, bases will harden and "oxidize" over time with normal use.

BASE CARE

The first rule of base care is to do no harm. The surface of the ski base will lose its pliability and capacity for modification over time with exposure to the air. Keeping wax on your bases will slow this process and extend the longevity of the base. Aside from time-induced damage the biggest threat to bases is poor treatment during waxing and tuning. Skis are heat sensitive in at least two ways. The base material will start to harden and "burn" when it is exposed to excessive heat - temperatures over about 130 degrees C are dangerous if the iron comes into direct contact with the base without a cushion of wax to absorb the heat. But the structure of the ski itself is at risk at much lower temperatures. The glue that holds skis together is heat-activated and at temperatures over about 70 degrees C most skis are prone to structural deformation. This is a risk when the iron is kept on the ski for long enough for the heat to penetrate to the core of the ski.

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. If more ironing time is needed the ski should be allowed to cool to room temperature before continuation of ironing.

SATURATION

In order to ensure good durability of race wax layers it is important that the base be well saturated with paraffin. Conventional wisdom holds that a ski must be waxed many, many times in order to thoroughly saturate it with wax. This is a myth that we suspect grew out of early stonegrinding which left bases in need of a lot of scraping and brushing to smooth them out. What was really necessary was a lot of mechanical work to dull and smooth the structure and get rid of PE hairs. Modern grinds made on XC-specific grinders don't require this, and bases can be made race-ready within hours of being ground. The base is sufficiently saturated after about five waxings with soft paraffin which is very fluid at low temperatures and easily penetrates the base. Additional waxing will not get the wax any deeper into the base.

CONDITIONING

The soft paraffin used to saturate the base gets absorbed easily, but also comes out of solution quickly and won't stay in the base for long. In order to ensure good durability and speed it is important to layer a harder wax on top of the saturating paraffin. Harder waxes with higher melt points do not penetrate the base easily on their own, but they readily mix with soft wax in the base, and will be drawn more deeply into the base when applied on top of a well saturated base than when applied on their own.

MAINTENANCE

The wax in solution in the base precipitates out over time.

This provides a certain level of continuous lubrication but it also means that the skis need to be re-waxed regularly. Always waxing the skis with one type of wax (soft or hard) will ultimately result in a ski with insufficient durability and speed, particularly when only softer waxes are used. It is common to use only hard waxes in dedicated cold skis, but in most circumstances it is a good idea to periodically clean, re-saturate and condition the base. To clean the base it is sufficient to scrape a soft paraffin directly after ironing. Alternatively, the new base (glide zone) cleaners available from most wax companies are very effective.

HEATBOX

The use of a heatbox can provide a tremendous level of saturation. The mechanism for absorption in the heatbox is different than under the iron. Absorption when ironing is based on a temperature gradient near the surface of the base, and depends upon heating the base material to a point where it begins to physically transform and "open". In the heatbox there is no temperature gradient – the wax is held at a near-fluid state and is absorbed very slowly. The amount of absorption is directly related to the amount of time in the heatbox. However, more saturation is not necessarily better – the role of saturation is to anchor conditioning wax and provide a base for a durable and fast race waxing job.

DAMAGE

Bases are subject to different types of damage over time. The least significant form of damage is small scratches or physical imperfections resulting from normal use. Many skiers return skis to us for grinding because of a "huge" scratch that we have a hard time finding on the ski when we start working on it. We also see a lot of skis from customers who are concerned that the bases are no longer flat. All skis tend to deform structurally over time and some types of deformation are inevitable based on the construction while others are due to overheating of the core. It is not necessary to have a perfectly flat base to ensure perfectly fast skis and skis do not need to be pristine to be fast. Perhaps the most common concern is "oxidized" or "dry" bases. This is when the base turns white in the high-pressure areas after skiing, particularly in abrasive conditions. This is generally due to polyethylene fibers collecting at the surface. Some base materials are more prone to this phenomenon than others, and there is no guarantee that it indicates damaged base. The more certain sign of damage is when wax shavings consistently come off the base with a dark color. This indicates a certain level of destabilization in the base resulting in additive material being pulled from the base during waxing. Again, some base materials are more prone to this than others, but it generally results from overheating or leaving the bases exposed to the air for a long time. Waxing with a hard graphite wax can sometimes help to re-stabilize the base material, but usually regrinding is indicated.

RACE WAXING:

PURPOSE

The goal of race waxing is to tune the characteristics of your base to the properties of the snow. Wax modifies the hardness and chemical properties of the base when it is absorbed. The wax contributes its hardness characteristics to the base surface and also provides a continual film of lubrication as it slowly comes out of the base.

LAYERS

A race wax job generally consists of paraffin underlayers and fluorocarbon top coats. At a Worldcup level it is generally accepted that the wax job will be paraffin, fluoro powder, and then an optimization layer of either fluoroblock or liquid.

PARAFFIN

Paraffin can come in more than one layer – particularly if graphite antistatic or molybdenum additives are required. Paraffin layers are generally used to tune the hardness of the base and provide support for the top-coats. Most racing paraffins are fluorinated, a process by which fluorine is attached to a hydrocarbon chain, creating a fluorocarbon molecule. Fluorinated paraffins offer a big advantage over non-fluorinated paraffins in most conditions – particularly in high moisture – but they don't replace pure fluorocarbons when it comes to race performance. However, they do bind well with pure fluoro topcoats and are a necessary part of a race wax job.

At the World Cup level paraffins are always tested in the speed trap and by feel as the first step in the testing process. While it is sometimes the case that the paraffin, or even a preliminary modifying layer, can be the key to a winning wax job, it is more often the case that the largest advantage will be found in the subsequent pure fluoro top coat layers. In most cases it is sensible to expedite the waxing process by selecting a suitable paraffin by reading the wax chart and following instructions. This will usually bring you close enough on the underlayer, and if you choose the right top coats, you will have fast skis.

FLUORO POWDER

Pure fluorocarbons are fast because they are extremely hydrophobic (water repellent) and can be quite durable when applied correctly. In many conditions paraffins can offer comparable starting speed but tend to slow down much more rapidly than fluorocarbons. In high moisture conditions skis without pure fluoros are not competitive. When fluorocarbons were first introduced the most prevalent question was not which fluoro powder to use, but whether to use one at all. Many racers carried one powder and used it only when conditions were quite wet. Fluoros still provide the largest advantage in very wet conditions, but it is now generally accepted that they provide an advantage more often than not. There is a wide variety of different products on the market and the differences between them on a given day can be huge. Pretty much every brand offers at least three different fluoro powders; a cold, a medium and a warm. If you want to keep life as simple as possible you can select the medium and warm powders from one company and use them according to directions. If you want to have more options you will need experience with local conditions, or else you will need to do some basic testing.



ERIC FLORA & RANDY GIBBS @ LIBEREC

GOOD TO REMEMBER

TRICKS OF THE TRADE AND RULES OF THUMB

PARAFFINS

- In Fine and Sharp snow crystals test a grade harder and lower fluoro content 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 under-layer prior to the final race paraffin layer.
- If conditions are abrasive or dirty test a moly/graphite paraffin like Holmenkol Matrix Black. If you don't have time to test, use the normal paraffin.
- In cold conditions, if the tracks are glazing, test a fluoro topcoat.

FLUOROCARBONS

- You can test a fluoro topcoat by rubbing and corking by hand, but to ensure durability for distances over a couple of km you should make a powder application
- In coarse granular snow test warm fluoros, even at colder temperatures.
- In old 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.

THE PROCESS

Optimization involves using fluoro blocks, liquids and hand structure to perfect the ski's performance.

The optimizer layers of a World Cup wax job offer the final one or two percent in performance gain, but it is often this step that can make the margin between a fair wax job and a great wax job. Optimizers tend to be inexpensive per application, and the advantages are readily available to all racers with relatively little investment in time and money. Testing optimizers by feel can be done effectively on a single pair of skis by comparing two products, keeping the winner and replacing the loser. We have tested over 10 fluoroblock and liquid applications for a single race using this method.

When testing time and resources are limited we have found that a simple by-the-book selection and application of paraffins and powders can provide the foundation for an outstanding wax job using optimizers to bring the top-end performance out of the skis. Given the relatively inexpensive and easy application, and the ease of testing multiple products, this is a great way to get extra performance out of your skis without breaking the bank.

OPTIMIZERS

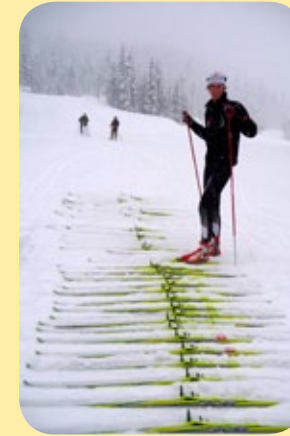
are generally fluoroblocks and liquids. Chemically these waxes are very similar (sometimes the same) as fluoro powders – the difference is in application. A fluoro powder application is made with an iron or rotocork and involves a great deal of heat. Optimizer applications are made cold, using hand-corking to spread and smooth the wax.

We sometimes will use a powder as an optimizer by hand-corking it. Christer Majbaeck of Ski*Go has speculated that the hand-corked application of a fluoroblock leaves the material pliable enough so that subsequent brushing can align the molecular structure on the base, creating a faster surface.



SKI TESTING

Of the many methods of testing skis, the two most common are testing by feel and speed trap testing. The speed trap offers objective numeric data, but limited application to real race situations since the skis are only tested in a half-weight gliding situation. Testing by feel sounds nebulous, but is phenomenally useful, particularly on race day when time is tight.



When testing by feel we like to focus on at least two different characteristics. To test climbing speed we pay attention to the release of the ski from the snow while aggressively climbing a relatively steep hill. To test higher speed we like to find a gradual descent where we can take long no-pole skate strides, and feel resistance under foot at high speed and full weight. It's amazing what you can feel if you imagine that you have tiny force gauges on the bottoms of your feet. It is important not to over think testing by feel, and to trust your intuition.

One very common method of testing is the glide-out. We don't use glide-out testing because it tends to isolate the performance of skis at half weight and very low speed – a set of circumstances that we hope you don't encounter on the race course.

One of the keys to testing is having test skis that are closely matched so that you know you are testing the differences between waxes, rather than testing the differences in the skis. It is a painstaking process to find test fleets of matched pairs that have similar flexes so that they all run the same given the same wax treatment.

Most people don't have test fleets, so a common solution is to swap skis from pairs so that you are evening them out. For example, if you have 2 pairs of skis, you could test by waxing one from each pair with wax A and one ski from each pair with wax B. Just remember to label the skis A & B so you don't mix things up.

HAND STRUCTURE OPTIMIZATION

The final part of the optimization equation is hand structure. It is common to think of hand structure as something to use only when it's quite wet. However, we find that hand structure modifications can make a big difference in almost any condition and it is used 99% of the time on the World Cup. While grinds and hand structures operate on many of the same principles, they can create very different surfaces and a combination of the two is usually optimal.

Hand structure is added to skis prior to the final fluoroblock or liquid application. This ensures that the structure won't be removed or modified by heat from an iron, but that it is coated with whatever final fluoro layer is selected. Skis should be brushed after the final fluoro optimizer is applied to ensure that all structure elements are clean and exposed.

We are working closely with the Jensens to develop new structure blades to ensure that the FiniteFinish structure tool can provide the platform for all your hand structure needs in the future. So far our competition testing at both World Cup and Nor-Am levels has been very encouraging and the tool has seen a lot of use. In addition to the FiniteFinish tool we recommend the Holmenkol Structure Roller and a Swix Super Riller with 0.75mm, 1.0mm and 2.0mm blades. Read more about hand structure and specific recommendations at bouldernordic.com.



INTRODUCING SKIGO, HOLMENKOL & BNS KITS

GURU WAX

BRINGING WORLD CUP SERVICE TO EVERYONE



WAX KITS

Take advantage of BNS's Ski Service expertise and find the best waxes to have in your wax box based on what works, not marketing hype. On this page, we've compiled the top waxes we use in our wax service work from the World Cup and North American races. We also put together a few starter kits from the best of the Ski*Go and Holmenkol lines to make it easier to see how amazing these wax lines are. Go to bouldernordic.com to see all of the kits we've put together as well as detailed information on every wax we sell.

CUSTOM WAX KIT CONSULTATION

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.

HOLMENKOL MATRIX STARTER KIT

Holmenkol Matrix Yellow, Red, Blue, Green 70g each
Kit Price: \$150 Retail Price: \$206 Save: \$56



HOLMENKOL FLUORO STARTER KIT

Holmenkol SpeedPowder Mid & Wet, Holmenkol Speedblock Mid & Wet
Kit Price: \$320 Retail Price: \$428 Save: \$108



SKI*GO FLUORO POWDER KIT

SkiGo C380, C105, C44, C22
Kit Price: \$330 Retail Price: \$415 Save: \$85



SKI*GO OPTIMIZER KIT

Blocks: C105, C44 Liquids: C105, C44
Kit Price: \$360 Retail Price: \$430 Save: \$70



GURU

Guru kick waxes and klusters from Sweden are legendary for their wide range, speed and durability. Until now it has been tough to get in the US, but now BNS will be distributing Guru, opening up a new level of kick wax performance. Absolute must-haves in the Guru Line are Extreme Hallgeir, Extreme 39, and Extreme 39 Hard. The other waxes on this list are excellent as well.



GURUWAX

HARD WAXES - \$18-\$22

EXTREME HALLGEIR -2°C to -10°C
Awesome binder and also works well atop Extreme 39 kluster. Best in course-grained and man-made snow.

GREEN -6°C to -20°C
For cold, new snow and as a binder

RED 0°C to -4°C
Newly Fallen snow, fine snow. Great mixed with Green for variable colder conditions.

YELLOW +1°C to -2°C
Newly fallen snow, fine snow

News Flash: As we are going to press with this, BNS will also be distributing Magnar waxes. See bouldernordic.com for updates.

KLISTERS - \$22-\$26

BLUE 0°C to -8°C
Works well as a hardener and mixed with other klusters.

EXTREME 39 +7°C to -2°C
Incredible kluster to mix with others for grainy and man-made snow.

EXTREME 39 HARD +4°C to -5°C
Tougher version of Extreme 39 works better in icy conditions.

RED +5°C to +15°C
Great Kluster in fine and coarse-grain snow & corn



	Powders	Fluoroblocks	Liquids
COLDER * *	Ski*Go C380 ** Solda HP06 ** Holmenkol Cold 59 **	FC7BS ** Holmenkol Cold 59 **	
	Ski*Go C105 ** Solda HP05 * *	Ski*Go C105 **	Ski*Go C105 * *
*	Holmenkol Mid 08 ** Swix FC8 **	Holmenkol Mid **	Maplus Med *
	Ski*Go C44 ** *	Ski*Go C44 *	Ski*Go C44 *
+ *	Holmenkol Wet 36 * *	Ski*Go C22 **	Maplus Hot *
	Ski*Go C22 *	Holmenkol Wet **	Ski*Go C22 *

* New Snow ** Old Snow / Fine-Grained Transformed Snow * Coarse Transformed Snow

	Kick Waxes	Klusters
COLDER * *	Ski*Go XC Green *	Rode Chola * Guru Blue * *
	Ski*Go HF Blue * Ski*Go HF Violet *	Rex Blue * *
*	Swix Extra Blue * Guru Hallgeir Extreme * *	Rode Special Violet * *
	Rode Weiss ** Swix VR45 * Swix Special Violet *	Guru 39 Hard * *
+ *	Rode Multigrade Violet *	Rode Violet * *
	Ski*Go HF Red **	Start Universal Wide **
*	Guru Yellow * *	Guru 39 * *
	Rode Fast Red Extra **	Rex OV *
*	Ski*Go XC Orange *	Rode Rossa Special **
	Ski*Go HF Yellow **	Rode Multigrade Universal *
*		Rex OI ** *
		Rode Rossa * *
	Ski*Go HF Yellow ** *	Rex OU * *

* New Snow ** Old Snow / Fine-Grained Transformed Snow * Coarse Transformed Snow



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.

Check out bouldernordic.com for BNS wax/tool kits and a comprehensive listing of tools from Holmenkol, SkiGo, Swix, Toko and more. We have a library of information and videos demonstrating wax application, ski prep, stone grinding and more.



HOLMENKOL PRO GROOVE SCRAPER – 20638

This pro groove scraper has always been one of our favorites. Once you try it, you will covet it as one of your most prized possessions. Now that we are importing Holmenkol directly, we're able to drop the price by over 30% from last year!



HOLMENKOL SCRAPER SHARPENER PRO – 20632

Another Holmenkol favorite that keeps plastic scrapers square and sharp. It includes a clamp for bench-mounting and enables you to quickly and easily maintain a sharp edge on plastic scrapers like a pro. Price is reduced significantly due to BNS importing Holmenkol.

HOLMENKOL DIGITAL RACING WAX IRON

This professional waxing iron with digital temperature display and electronic temperature control is identical to the Star Iron that we've been in love with for years. The heavy-duty sole plate and high-quality temperature control unit give you a precise iron that reaches temperature quickly and holds it tightly. We are able to reduce the price of this iron from previous levels due to our direct connection to Holmenkol.



Can't shell out the cash for the digital? We have a limited supply of the exact same iron with dial temperature control that is a tremendous value for an amazing iron.



THE SWIX T7941 WORLD CUP WAXING PROFILE

Came directly from the World Cup - Swix copied a special profile that all of the top World Cup techs use. It locks in skis of any length without any adjustment, so it is great for teams or families that are constantly switching between ski lengths. We have these in our back shop and we get grumpy any time we have to use anything else. The strong vice holds skis firmly with plenty of clearance for structure tools, and can even lock in skis without bindings.



SWIX STIFF NYLON BLACK BRUSH

This Swix brush is an excellent first brush for Cera F and other fluoro powders. It does quick work of getting through the bulk of the powder, leaving the ski ready for further polishing. We like to follow it with the Boar's Hair Brush and then the Blue Nylon Brush. Comes in the Pro Oval version as well as a rectangular version. T199



SKIGO NATURAL CORK 68151 F

The SkiGo cork is huge and does an amazing job corking in liquids and blocks. We have one for the black waxes (graphite/moly additives) and one for the clear in our kits.



SKIGO STEEL BRUSH 68309

This brush has long, fine bristles that do incredibly quick and detailed work on the ski base, opening the structure, but not introducing new structure like other steel brushes. Stainless steel brushes are used extensively for work with paraffins, and this is the best steel brush out there.



HOLMENKOL STRUCTURE ROLLER

The Holmenkol Structure Roller is a very simple structure tool that we used on the World Cup more than any other structure tool. Often we run it with just one of the rollers installed. It creates a linear draining structure that we have found to be good in cold conditions (one roller) and wet conditions (two rollers).



STRUCTURE TOOL FINITE FINISH

Ski Tools Built by Ski Racers

Brothers Eric and Joe Jensen developed the Finite Finish Tool over the course of 4 seasons at their AceCo Precision industrial knife and tool plant in Boise, Idaho. AceCo's President, Raleigh Jensen, has been ski racing for over 30 years and passed his love for the sport to his sons Eric and Joe. Both avid ski racers for most of their lives, they are still top-level masters athletes, each winning multiple medals at the 2008 World Masters Championships.

AceCo has designed and tested 5 different tool bodies and over 30 unique structure patterns before settling on the 6 patterns currently offered under the Finite Ski Tools brand. The original structure rollers were developed for national-level racers and Zach & Nathan have used them on the World Cup and they have made it into races more than once. Similar tools from Europe are generally lower quality and cost significantly more, generally \$1500+.

BNS has been closely working with the Jensens on design and development throughout the process. Currently we are developing new structure drums and technologies to make the Finite Finish tool even more versatile than it is now. The Finite Finish tool is an excellent way to optimize skis the day of the race and gives teams and individuals a way to modify skis to cover broader ranges of snow conditions.

See Zach's article about optimization on page 13 for more ways to use the Finite Tool and other optimizations to give your skis that extra bit of speed on race day.

Price List

FINITE FINISH ROLLERS

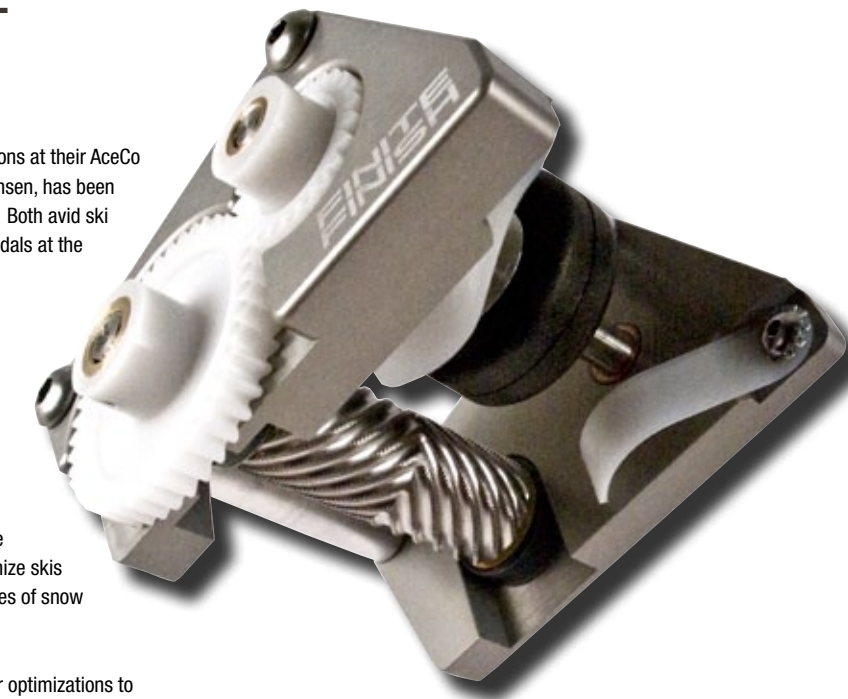
- V10 1.0mm Pitch x 1.0mm Amplitude, Broken Pattern \$75.00
- V05 0.5mm Pitch x 0.5mm Amplitude, Broken Pattern \$75.00
- V03 0.3mm Pitch x 0.3mm Amplitude, Broken Pattern \$75.00
- L04 0.4mm Pitch x 0.4mm Amplitude, Linear Pattern \$75.00
- L02 0.2mm Pitch x 0.2mm Amplitude, Linear Pattern \$75.00
- AF10 1.0mm, AQUAFLUSH CHEVRON (press only) \$75.00

FINITE FINISH KITS

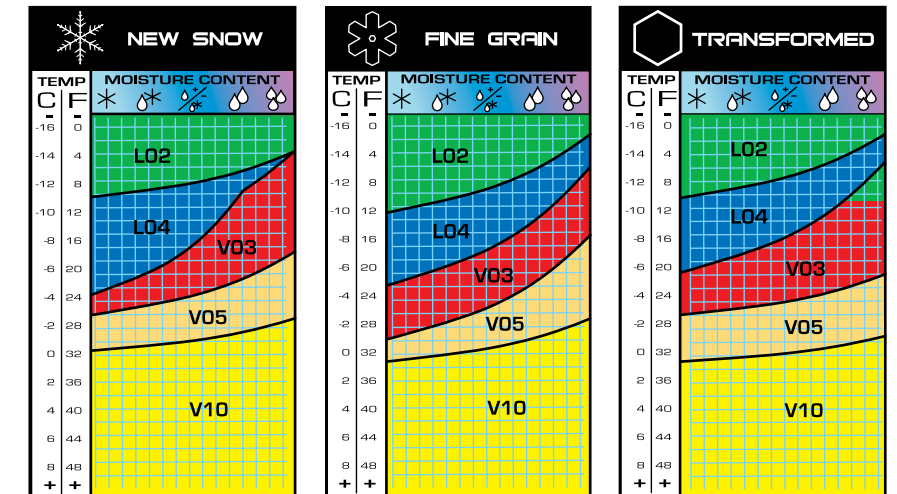
- FFKIT2 Tool Body, 2 Rollers: V10, V03, Case \$299.00
- FFKIT5 Tool Body, 5 Rollers: V10, V05, V03, L04, L02, Case \$499.00

FINITE FINISH TOOL BODY

- FFTB FINITE FINISH Tool Body Complete, no rollers \$199.00



STRUCTURE OPTIONS



HOLMENKOL: A TRIP TO STUTTGART

By Nathan Schultz

When we first discovered that the Holmenkol distributorship in the US was available, I jumped on the opportunity due to our experience using the wax on the World Cup and at races in North America. I got the chance to swing by their headquarters just outside of Stuttgart, Germany in June before I went to the Atomic/Salomon factory in Austria to pick skis.

I learned a lot about Holmenkol's history and business. It is the oldest ski wax company in the world and began as a ski-jumping chemist's hobby in 1922. While history is evident everywhere in the company with old posters and wax tins displayed everywhere in the building, Holmenkol is purely a chemical company that is highly focused on development of sports coatings. There is no mistaking this vision and focus when talking to anyone – from the marketing people to the chemists and the world cup racing staff. It is a tangible belief everywhere in the company that Holmenkol is developing superior waxing products due to their tight focus on chemistry and development.



The facility attests to the company's passion. Their entire headquarters, production, research laboratory, warehouse and offices are housed in a single building that they remodeled and moved into two years ago. In true German style, everything is clean, open and well-planned and executed. The staff of 28 has open offices clustered in groups of people who work closely together. The production room is spotless and has its own warehouse area for raw materials to keep the production environment clean and separate from the warehouse for finished products. Everywhere we went, there were little things that showed their passion for executing their vision.

The research lab has three chemists working full-time on research, development and testing. This was the most exciting place for me to visit and I had to be dragged away from discussions with one of their chemists who was demonstrating some of the research that is producing interesting results. The core of Holmenkol's technology is nano-coating particles to add desirable physical effects to traditional wax (see article to the right). They demonstrated a few areas of exploration they are taking with their patented technology, and it was fascinating to see the possibilities that nano-CFC is opening up.

I left Holmenkol excited to see a company in the ski industry moving forward. The economy and recent problems with lack of snow have hit the ski industry hard, and almost everywhere, many companies are slashing staffing to minimums and just trying to continue. That is definitely not

the case with Holmenkol and it will be interesting to see where this development will lead them in the next few years.

We will be writing more about this relationship as the season progresses, so check bouldernordic.com or sign up for our email newsletter to find out about the latest developments and new projects we are creating with Holmenkol. We will be working as Holmenkol Olympic wax techs as well as providing testing information straight from the World Cup to help us better understand the wax and help simplify and give you confidence in your wax choices.



DRASTICALLY REDUCED PRICE

SpeedPowder Matrix: The patented nano-CFC® formula combines the excellent sliding properties of conventional fluor carbon powders with the physical surface effects of nano composites. The result: Together with HOLMENKOL® racing wax, you get a first class sliding coating for your racing base, which sets new standards in terms of speed, abrasion resistance, range of applications, and ease of use.

SpeedPowder Matrix WET

Best range: Damp to wet new snow and fine grained to slushy snow, wet snow. **24341** 30g

SpeedPowder Matrix MID

Best range: New and fine grained snow or damp artificial snow. **24343** 25g

SpeedPowder Matrix COLD

Best range: Fine and coarse old and artificial snow, cold snow below -8° C. **24345** 30g



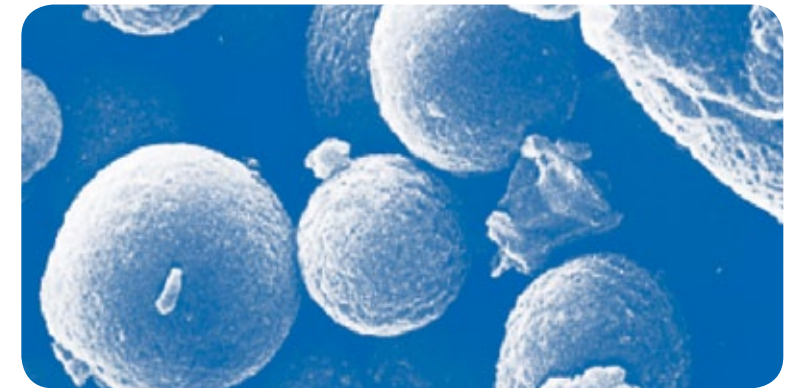
ZACH TALKS NANO

By Zach Caldwell

“Nano” has become such an overused and misused catch-phrase in the marketing world that we tend to ignore or dismiss it, or just figure it refers to something really small. In fact, nano denotes 10⁻⁹, or one billionth. A nanometer is one billionth of a meter – seriously tiny. When I first saw the nano-CFC badge on the fluoro powders that Holmenkol released last season I figured it was a marketing gimmick. Fine with me, as long as the wax is fast.

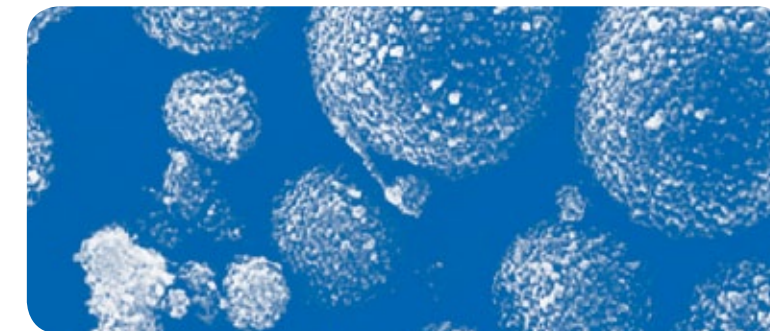
On his trip to the Holmenkol headquarters and production facility in Stuttgart this June, Nathan found out that nano-CFC is not just marketing jargon. It's technology that allows Holmenkol to coat any substance (or “substrate” – base material) with a nano-composite. The party-trick the Germans use to illustrate the technique is to coat water droplets with an inert nano-composite, making powdered water. Nathan showed up in Austria with several vials of powdered water which was good for some ooohs and aaaahs. As cool as powdered water might be, it wasn't immediately apparent why coating a fluorocarbon substrate with a nano-composite would be advantageous.

the Lotus Effect. It's a term that describes the ultra hydrophobic self-cleaning surface of a lotus leaf which is a result of a combination of macro- and micro-structural elements, along with a waxy hydrophobic coating.



Wax particle without nano-CFC coating

The nano-CFC technology is used currently in the Matrix powders and SpeedFinish liquids with more applications in development. Extensive testing of the nano-CFC powders shows significant increases in durability and speed when compared against the same compounds that are not nano-CFC coated as well as existing waxes. This difference is especially noticeable after 10km of skiing. In the liquid SpeedFinish waxes, nano-CFC makes the wax particles self-arranging in a matrix that increases cross-linking and greatly enhances abrasion resistance, water repellency and glide. Holmenkol's three full-time chemists are experimenting with using nano-CFC to add new raw materials to the coating that impart additional desirable chemical properties to the substrate wax. Many of these coatings have been investigated for use in ski wax due to their highly desirable characteristics, but it was impossible to use them in waxes because they would not bind to anything. nano-CFC is enabling Holmenkol to use these compounds in waxes and initial testing shows great potential.



Wax particle with nano-CFC coating

The answer is in the “CFC” part of the marketing tag-line, which refers to “coated fractal crystallization”. The nano-coating in use in the Holmenkol powders is there to impart unique physical properties to the fluoro substrate. Specifically, it's there to create a nano-structural coating – a super fine rough surface that reduces surface area contact in a manner analogous to

Liquid Matrix

SpeedPaste Racing

24370 30g

SpeedFinish WET

24361 50ml

24361-R Racing Pack (50ml, w/out cork)

SpeedFinish MID

24363 50ml

24363-R Racing Pack (50ml, w/out cork)

SpeedFinish COLD

24365 50ml

24365-R Racing Pack (50ml, w/out cork)

DRASTICALLY REDUCED PRICE



Speed Block Racing: World Cup proven formula for extreme acceleration and high speeds.

To be rubbed onto prepared sliding surfaces or other Speed coatings. May be applied anytime until shortly before the start of the race.

SpeedBlock MID

24353 15g

SpeedBlock COLD

24355 15g

SpeedBlock WET

24351 15g



BNS selling Holmenkol and SkiGo directly to you means:

1. Significantly lower prices per application on all waxes
2. Better knowledge, experience and advice to support you
3. We are brand neutral. We help you pick the best from each brand so your kit is the best, not just all one color.

HOLMENKOL: PARAFFIN GLIDE WAXES

The Matrix line is unique in the world of high performance fluorinated paraffins. Most companies offer three lines of racing paraffins with different levels of additive content, leaving it up to the skier to determine which level of additive is appropriate for which condition. Each wax in the Matrix line is precisely engineered to have additive content compatible with the conditions specified – the warm waxes have very high levels of fluoro additive while the cold waxes have appropriately moderate levels of fluoro combined with great hardening characteristics. Price is graduated along with the additive content making Holmenkol Matrix much more affordable compared to other racing waxes.

SKIGO AND HOLMENKOL NOT ONLY HAVE SUPERIOR OR EQUAL PERFORMANCE, THEY COST A LOT LESS!

- Holmenkol Matrix Yellow/Red: \$0.63/g (150g) \$0.83/g (70g)
- Holmenkol Matrix Blue/Green: \$0.47/g (150g) \$0.64/g (70g)
- SkiGo HF \$0.75/g (200g) \$1.20/g (50g)
- Swix HF \$1.78/g (180g) \$2.25/g (40g)

RACING HIGH FLUOR MATRIX



- | | | | | | | |
|--|---|--|---|---|--|---|
| <p>Matrix^{FX} YELLOW
For damp new and fine snow as well as wet snow.</p> <p>24250 2x35 g
24251-150 150 g
24251 3x150 g</p> | <p>Matrix^{FX} RED
For damp to dry new and fine grained snow as well as artificial snow.</p> <p>24260 2x35 g
24261-150 150 g
24261 3x150 g</p> | <p>Matrix^{FX} BLUE
For dry new and fine grained snow as well as artificial snow.</p> <p>24270 2x35 g
24271-150 150 g
24271 3x150 g</p> | <p>Matrix^{FX} GREEN
For dry new, grained and aggressive snow.</p> <p>24280 2x35 g
24281-150 150 g
24281 3x150 g</p> | <p>Matrix^{FX} BK/YEL
For old, coarse-grained, spring-grained and artificial snow.</p> <p>24290 2x35 g
24291-150 150 g
24291 3x150 g</p> | <p>Matrix^{FX} BK/RED
For dry old, grained and aggressive snow.</p> <p>24292 2x35 g
24293-150 150 g
24293 3x150 g</p> | <p>Matrix^{FX} BK/BLUE
For dry old, grained and aggressive snow.</p> <p>24294 2x35 g
24295-150 150 g
24295 3x150 g</p> |
|--|---|--|---|---|--|---|

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

Ironing 101

Proper iron temperature is important to ensure that the ski is not damaged during the application of waxes. The correct iron setting should allow the wax to flow easily on the base. Iron three times moving quickly tip to tail and that is plenty.



- Matrix^{FX} YELLOW 110° C
- Matrix^{FX} RED 120° C
- Matrix^{FX} BLUE 125° ~ 130° C
- Matrix^{FX} GREEN 140° ~ 150° C
- Matrix^{FX} BK/YEL 125° C
- Matrix^{FX} BK/RED 130° C
- Matrix^{FX} BK/BLUE 140° C

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

BASE WAX HYDROCARBON



- Alphamix YELLOW**
For soft, new and fine grained snow.
- 24100 3 x 35 g
24105-150 150g
24105 6 x 150 g
- Betamix RED**
For all types of snow, especially coarse-grained, dry, old and aggressive snow.
- 24110 3 x 35 g
24115-150 150g
24115 6 x 150 g
- Ultramix BLUE**
For cold, particularly old and aggressive snow.
- 24120 3 x 35 g
24125-150 150 g
24125 6 x 150 g

TRAINING LOW FLUOR



- Fluormix WHITE**
For all types of damp to wet snow.
- 24130 3 x 35 g
24133-150 150g
24133 6 x 150 g

KICK WAX & KLISTER



Our Favorite Tools From All Brands on page 16

- Groove scraper**
Professional groove scraper made from aluminum, different diameters work with all x/c ski grooves. **20638**
- Scrapers Sharpener PRO**
Bench-mounted professional scraper sharpener with 4-sided steel blade. Keeps plastic scrapers square and sharp. Includes clamp. **20632**
- Cross Structure Tool Nordic**
Outstandingly effective structure tool with two rollers for cross pattern structure. Best results on wet and glazed snow. **24485**
- Oval Brush Steel Micro Finish**
Ultrafine steel brush for complete cleaning of base structure. A must-have in racing. **24523**



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																			
Blue																			
Violet																			
Red																			
Red Spezial																			
Universal																			
Silver																			
Black Spezial																			

INTRODUCING SKI*GO

By Roger Knight

When I first thought of trying to import Ski*Go wax five years ago it seemed a daunting task. I would not only have to re-introduce a wax line to the US that hadn't had a presence here except at the very top end for years, but also learn the ins and outs of import and distribution in the US. I decided that I'd leave it open and meet with Christer Majbäck, former World Cup skier and now owner and operator of Ski*Go. After meeting with Christer there was no possible way to say no. Christer's passion for wax and innovation came through immediately and it was contagious. Based in Kiruna, Sweden, Christer is involved in every step of the process including wax development.

We worked out the details and the wax arrived, and soon I realized that there was a lot more to Ski*Go than I knew! The whole reason behind contacting Ski*Go about US distribution was because I had seen at the high end how much Ski*Go powders and liquids were used. I had no idea how complete and amazingly good their wax line was. After extensive testing I began to understand that from hydrocarbon waxes to HF waxes, from klister to kickers, and from liquid fluorocarbons to the solids and powders, Ski*Go was as complete a line of wax as there was out there. Now with BNS distributing Ski*Go to a more national audience, it allows everyone to discover just how amazing this wax line truly is.

While some wax lines preach simplicity, Ski*Go speaks about simplicity and performance. The key with Ski*Go gliders is that they go by snow type and condition not just temperature. Obviously at 25 degrees Fahrenheit new snow has very different properties than old snow does. Ski*Go addresses this in their entire line, from hydrocarbons to pure fluorocarbons to kickwaxes. It is this attention to detail that allows Ski*Go to outperform other waxes that just go by temperature. Determine the temperature and snow type, and then it is easy to pick a hydrocarbon, a LF, a HF, a pure fluoro, or a kickwax.

Ski*Go has a major advantage in their HF line of kickwaxes because of a proprietary high fluorocarbon that is used allowing the wax to perform exceptionally across a wide range of temperatures and conditions. Though the waxes are a little more expensive than some other waxes out there, their range is incredibly wide and they replace three to four waxes from other wax lines with better performance, actually lowering the cost.

Ski*Go has the best pure fluorocarbon line in the world. In powders and solids, simple and concise is the way. C105 works best in the colder conditions in all snow types, but especially in newer snow. C44 is the industry standard as a mid-range fluoro, and with a tweak to it this year, C44 is now excellent in all snow types. C22 is the choice for warmer conditions and when there is a lot of moisture present. C22 over HF Yellow (formerly C242) is incredible in saturated wet snow.

We hope you enjoy Ski*Go as much as we do. Though a small company, Ski*Go packs a big punch with wax performance and we want you to experience this. As always please do not hesitate to contact us with any questions!

OLEG (RIGHT) REVIEWS THE WAX TESTING RESULTS TO THE CREW INSIDE THE US SKI TEAM WAX CABIN AT THE 2009 WORLD CHAMPIONSHIPS



BNS selling Holmenkol and SkiGo directly to you mean:

1. Significantly lower prices per application on all waxes
2. Better knowledge, experience and advice to support you
3. We are brand neutral, so we can help you pick the best from each brand so your kit is the best, not just all one color.

KICK WAX

Base binder
For abrasive snow conditions to be applied to help regular waxes adhere to the kick zone longer.



LF orange
+3..-2C / 37..28F
When orange XC is not enough.
Resists dirt pickup.



LF violet
0..-6C / 32..21F

Can be used down to -8C/18F. All snow types.



XC yellow
+5..-1C / 41..30F
As the snow becomes more coarse than for orange. Try before moving to klister.



XC orange
+3..-2C / 37..28F
For variable conditions around freezing.
Former name: Skigo Yellow



XC red
0..-2C / 32..28F
At freezing and just below. Good for improving grip with purple or blue in the 10-15cm just ahead of the binding.



XC violet
-1..-9C / 30..16F
All snow types.
Works even outside range listed on tin.



XC blue
-3..-10C / 27..14F
Very durable. Works well in coarse snow. Can be warmed in as an underlayer for warmer waxes.



XC green
-7..-20C / 19..-4F
All snow types in cold conditions. A good overlayer on other kickwax with penetrating snow.

HF KICK WAX LEGENDARY! MUST HAVES



HF yellow +4..0°C / 39..32F
For all snow conditions. **90242**

HF red +1..-3C / 34..27F
All snow types. A distinct and soft grip. Contains high amounts of a new fluoro. Generously apply 4-6 layers. **90246**

HF violet -2..-15C / 28..5F
For new and fine structured snow. High humidity. **90247**

HF blue -1..-20C / 30..-4F
All snow except new snow. Functions excellently across its entire temperature range. A soft and distinct grip. Contains high amounts of a new fluoro. **90245**

KICK WAX TABLE

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 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 alt. blue HF



BRINGING WORLD CUP SERVICE TO EVERYONE



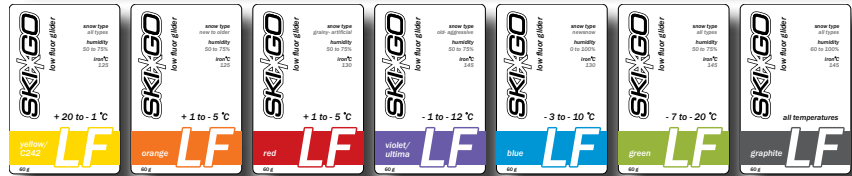
BRINGING WORLD CUP SERVICE TO EVERYONE



XC GLIDE WAX

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

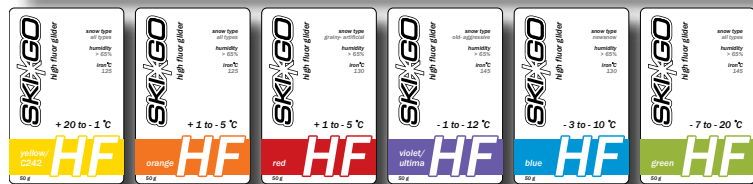
Wax	Snow type	Temp C / F	# 60g	# 200g
Soft	all	+15..0 / +59..+32	63340	-
yellow XC	all	+20..-1 / +68..+30	63705	64251
orange XC	new to older	+1..-5 / +34..+23	64201	64252
red XC	granular, artificial	+1..-5 / +34..+23	64210	64253
violet XC	older, aggressive	-1..-12 / +30..+10	64240	64254
blue XC	new snow	-3..-10 / +27..+14	64230	64255
green XC	all	-7..-20 / +19..-4	64220	64256
graphite XC	all	all	64250	64257



GLIDE WAX LF

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.

Wax	Snow Type	Temp C / F	# 60g	# 200g
yellow LF	all	+20..-1 / +68..+30	69004	69008
orange LF	new to older	+1..-5 / +34..+23	69002	69009
red LF	granular, artificial	+1..-5 / +34..+23	69001	69010
violet LF	older, aggressive	-1..-12 / +30..+10	69006	69011
blue LF	new snow	-3..-10 / +27..+14	69005	69012
green LF	all	-7..-20 / +19..-4	69003	69013
graphite LF	all, RH 0-100%	all	69007	69014



GLIDE WAX HF

High fluoro glide waxes for humidity over 65%. Spread and warm with a wax iron (temperature on package). For racing. HF waxes have had a lot of research and development and can in some conditions work even better than fluoro powders and fluids. 50g and 200g packages.

Wax	Snow Type	Temp C / F	# 60g	# 200g
yellow HF	all	+20..-1 / +68..+30	63014	63025
orange HF	new to older	+1..-5 / +34..+23	63015	63026
red HF	granular, artificial	+1..-5 / +34..+23	63016	63027
violet HF	older, aggressive	-1..-12 / +30..+10	63013	63028
blue HF	new snow	-3..-10 / +27..+14	63017	63029
green HF	all	-7..-20 / +19..-4	63018	63030

SKIGO AND HOLMENKOL NOT ONLY HAVE SUPERIOR OR EQUAL PERFORMANCE, THEY COST A LOT LESS!

SKIGO HF	\$0.75/G (200G)	\$1.20/G (50G)
SWIX HF	\$1.78/G (180G)	\$2.25/G (40G)
SKIGO LF	\$0.28/G (200G)	\$0.37/G (60G)
SWIX LF	\$0.44/G (180G)	\$0.50/G (60G)



GLIDE: COLD POWDERS

These are specially crafted synthetic waxes to resist abrasion and work in conditions that are very cold. C380 is very famous for its abilities. An underlayer of Graphite, Graphite LF, Green LF or Green HF should be applied. 60g canisters.

Cold Powder	Snow Type	Temp C/F	Humidity	Product#
P16	artificial/aggressive	-4..-25/+25..-13	65-100%	63901
C75	older snow	-7..-20/+19..-4	40-70%	63902
C380	dry & abrasive	-7..-20/+19..-4	0-60%	63900

GLIDE: FLUID

ADVANCED FLUORO SUSPENSIONS.

C22 Fluid, +15/-2 °C, All snow conditions(63010)

C44 Fluid, +2/-9 °C, Coarse snow (63012)

C55/C99 Fluid, -2/-10 °C, New snow - fine grained snow (63011)

C105 Fluid, -4/-15 °C, Fine grained - old snow (63002)



Ski*Go has the best pure fluorocarbon line in the world. The simple and concise powder line-up belongs in every wax box. C105 works best in colder conditions in all snow types, but especially in new snow. C44 is the industry standard as a mid-range fluoro, and a tweak to it this year expands its range to all snow types, not just old snow. C22 is the choice for warmer conditions and is unbelievably good in saturated wet snow.

GLIDE: FLUORO POWDER

C22 Powder: +1 °C and warmer for all snow conditions. Use Yellow as the underlayer. Set iron to 190 °C. (63004)

C44 Powder: +4/-4° C For all snow conditions. When temperatures get warm move to C22. The underlayer may be Violet HF, Red HF on Orange HF mixed with Yellow HF. (63001)

C105 Powder: +1 / -15 °C. Fine snow and new snow. Underlayer of Orange HF, Violet HF mixed with Orange HF or Blue HF. (63005)



GLIDE: FLUORO BLOCKS

Wax	Snow Type	Temp C/F	Humidity
C22 solid	all	+20..-4/+68..+25	65-100%
C44 solid	all except new	+3..-9/+37..+16	40-70%
C105 solid	new and fine	+1..-20/+34..-4	0-60%



Always use Graphite as the bottom underlayer for durability. Not needed for races shorter than 2.5km. Fluids give a harder surface than powders. Fluids are for aggressive snow, and powders are for newer and finer structured snow.

- Top with C22 solid
- Top with C44 solid
- HF = High Fluoro
LF = Low Fluoro

Snow type	Coarse snow Artificial snow		Old snow		New snow	
	<60%	>60%	<60%	>60%	<60%	>60%
Rel. Humidity Temp °C / °F						
+15 ... +5 C +59 ... +41 F	Yellow LF + C22	Yellow HF + C22	Yellow HF + C22	Yellow HF + C22	Yellow HF + C22	Yellow HF + C22
+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
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
-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



SKATING

SALOMON S-LAB SKATE PRO

NEW



The new S-Lab Skate Pro is full of features that Salomon has been testing for the three years that the highly successful S-Lab has been around. The S-Lab Pro adds a carbon fiber cuff, power strap across the forefoot, an extended carbon-fiber heel cup and RS17 – the pivot point is moved 7mm back from previous generation boots to give a better skate push. This boot upgrades performance from the previous generation S-Lab with more stability, adjustability and support and was a success in our long-term testing this spring.

SALOMON RS CARBON

NEW



Salomon RS (Men's) and Vitane (Women's) Carbon receive an upgrade this year with a new Energizer Cuff, water-resistant seamless construction and re-introduction of the Sensi-fit envelopment around the top of the foot. This is historically our most popular boot with a slightly roomier fit than the S-Lab, combined with Carbon Fiber sole creating a great balance of price and performance. The Vitane uses a narrower heel, higher-arch last with the same features and materials as the men's RS.

ALPINA ELITE CARBON SKATE - ECS



The Elite platform has a minimalist design for an ultra-light, direct connection to the ski. Amazingly light, the ECS uses 3-D carbon molding on the cuff to provide just the right stability without getting in the way. **NEW** this year is the availability of a custom ECS boot built specifically to your foot. Call for details.

ALPINA SSK



The evolution of Alpina's highly successful TCS boot, the SSK adds a 3-D molded carbon fiber cuff to increase stiffness and reduce weight. Ultra-light at 580g with a carbon-titanium cuff and precise "Posifit" heel retention, this boot comes in many sizing options to give a great fit. New this year is the availability of a custom SSK boot built specifically to your foot. Call for details.

FISCHER CARBONLITE



The Fischer Carbonlite Skate's snake lacing, carbon cuff and stiff sole flex make this a purebred racing boot. The sole is very torsionally stiff and provides a ramped toe that makes the ski squirt forward on the skate push. This boot is very rigid and takes some time to break in, but our long-term testers all enjoy skiing with this boot.

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 testing every boot made on snow.

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.

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.

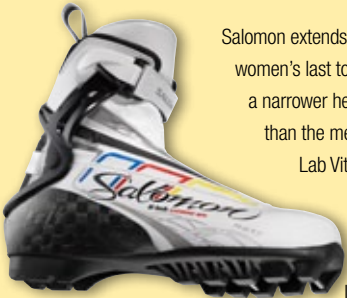
Your heel will lift up if you step onto your toe. If you make that motion while skating, you need to attend one of our technique clinics, so don't worry about it. As long as you don't get any lateral motion or rubbing in the heel as you push off laterally with the entire foot, the boot will work well. 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.

WOMEN'S SPECIFIC FIT SALOMON S-LAB VITANE SKATE

NEW



Salomon extends the successful women's last to the S-Lab line with a narrower heel and higher arch than the men's S-Lab. The S-Lab Vitane does not have the carbon fiber cuff or power strap of the S-Lab Pro, but it does share the RS17 technology for excellent performance and specific fit

BOOTS



NEW

BNS PAYS SHIPPING ON BOOT EXCHANGES!

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 on-line and our staff are available to consult on boot questions so that we can make the best assessment possible from a distance. Second, BNS will pay outbound shipping on exchanges for different sizes or models. 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. To qualify for free outbound shipping, you must ship the boots back to us within 7 days of receipt and they must be in new condition. We will exchange the boots and ship them back to you for free.

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.

NEW! We have added Sole insoles to our line-up. These inserts have much more aggressive arch support and can be easily custom-molded at home by heating them in your oven, then standing in your boots.

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?

CLASSIC

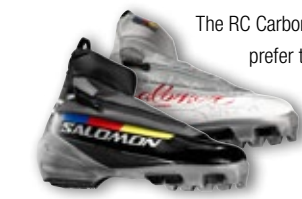
SALOMON S-LAB CLASSIC

NEW



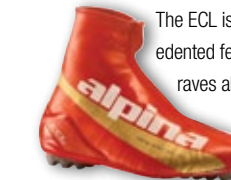
The S-Lab Classic is one of our most popular boots due to the fit and features. The performance fit has relatively low volume, with a carbon heel cup and one-piece carbon fiber sole making it one of the lightest, stiffest boots around. Everyone who uses this boot in our shop likes it for fit, support and the precise, supple feel for the ski the buttery soft sole provides.

SALOMON RC/VITANE CARBON CLASSIC



The RC Carbon Classic is another solid boot from Salomon. Most BNS skiers prefer the S-Lab's silky soft one-piece carbon sole, but the RC is a roomier, less-expensive option with performance options that put it among the best.

ALPINA ELITE (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. Everyone who tries this boot raves about it as the best boot they have ever skied. **NEW** this year is the availability of a custom ECL boot built specifically to your foot. Call for details.

SALOMON S-LAB SKIATHLON

NEW



The Salomon Skiathlon boot is an incredible combi boot that sacrifices little performance in either technique. With the carbon heel cup and one-piece carbon sole specifically designed for both skate and classic, the boot provides incredible lateral stiffness while maintaining flexibility in the forefoot for classic. A favorite for coaches and athletes alike when you want a single pair of boots to do the job.

ALPINA SCL



Like the TCS, the SCL has the precise heel adjustment of "Posifit", giving this boot a lightweight, minimalist feel, yet with the torsional stability to provide excellent control. Comes in 1/2 euro sizes in regular and narrow widths for precise fitting options.

FISCHER CARBONLITE CLASSIC



The Fischer Carbonlite Classic boot has Fischer's advanced snake lacing system and supple sole that produce excellent feel and flex at the ball of the foot while maintaining torsional rigidity and control. Eric skis in this boot and loves it for the feel and flex on the ball of the foot.



CLOTHING DESIGNED FOR CROSS-COUNTRY SKIING

SWIX WOMEN'S CARBONATE

This year's new Women's Carbonate is an excellent year round training set. Thin, very light 3 layer stretch membrane front with jersey backing. Wind and water resistant, highly breathable for cross-country skiing and running. Polyester/spandex stretch panels under arms and on back for added breathability. Articulated sleeves and knees for added flexibility. Spandex lined collar with zipper garage and draft flap. Rear zipping pockets and drop tail, 2 zipping lower front pockets and a sleeve pocket. Knee-length zippers and elastic cuffs on the pant. Reflective details for visibility in low light conditions.



SWIX WOMEN'S PRO FIT

The Swix Pro Fit is a high-performance set incorporating a lightweight, 3-layer soft shell with stretch panels and laser-cut ventilation holes for extra breathability. Fully bonded seams with fitted cut and articulated sleeves and knees for flexible movement. Elastic inner cuff and reflective trim for night visibility. Full front zipper and a zippered chest pocket.

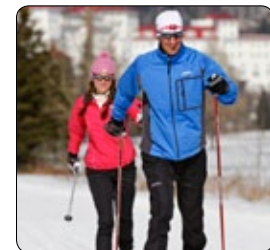


This is an impressive jacket and truly amazes once you put it on. The fit is perfect and the jacket flows unnoticeably with movement.

SWIX MEN'S PRO FIT

The Swix Pro Fit is a high-performance set incorporating a lightweight, 3-layer soft shell with stretch panels and laser-cut ventilation holes for extra breathability. Fully bonded seams with fitted cut and articulated sleeves and knees for flexible movement. Elastic inner cuff and reflective trim for night visibility. Full front zipper and a zippered chest pocket.

This is an impressive jacket and truly amazes once you put it on. The fit is perfect and the jacket flows unnoticeably with movement.



TOKO WOMEN'S NANNA

The Nanna Women's jacket is one of our most popular jackets. Women love the warm fleece lining, laser-cut welded seams and great looks of this warm soft shell jacket.

A warm soft shell pant with full-length side zippers and fleece lining. Hybrid construction offers wind protection on the front panels with high breathability on the back for cold winter days.



CHAMPION WS

A thin, snug-fitting glove with wind-proof Windstopper perfect for racing or warm weather.



WOMEN'S THERMO WS MEN'S THERMO WS

When a middle-weight glove isn't enough this is the glove to keep your fingers warm in all conditions. Windproof and breathable for a wide range of uses, a favorite for those cold blustery days.



CASCO NORDIC VAUTRON SHIELD

The popular Casco shield gets a big upgrade for 2010 with the addition of Vautron Intelligent Lens Technology. Vautron is an optically superior polymer used in Apache Helicopter windshields that is photochromic and automatically adjusts to light conditions to quickly provide the appropriate amount of filtering. The flip-up shield goes all the way across the face without sitting on the nose, reducing fogging dramatically and providing excellent coverage with the option to easily flip the shield out of the way.



DRINK BELTS

SkiGo & 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.



AIRTRIM COLD AIR MASK

The AirTrim Mask recovers the heat and moisture from exhaled air and filters and warms the air you inhale, protecting your air passages from the cold. Three different filters allow different levels of protection for normal training, asthma sufferers and high-intensity training.



CRAFT

CRAFT PRO & PRO ZERO EXTREME BASE LAYERS

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.



SKIGO SOFTSHELL SET

US Introductory price \$110 per piece or \$205 for the set.

A softshell jacket and pant specially made for xc skiing and running training. Functional stretch panels with pre-shaped knees and sleeves provide excellent freedom of movement. The contoured jacket back has high ventilation stretch material for top comfort that also reduces air resistance by shaping to the wearer. The Jacket also comes with zippered pockets, stretch cuffs and drawstrings at the waist & neck. Pants come with removable suspenders, zippered pocket, zippered cuffs and vented knees. This set is perfect as warm-ups and on colder days. Men's and women's sizes.



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.

SKIGO MICROGRID SET

US Introductory Price \$85 per piece or \$160 for the set

This windbreaker set with light functional fabric comes with several technical solutions. The jacket and pants are both fitted with a stretch material to give a firm, close fit and good breathing capacity across the entire back. The pants have a windproof front and zippered cuffs. The jacket comes with zippered pockets and drawstrings at the waist & neck. Stretch panels in the sleeve and back give excellent freedom of movement. This set is perfect for training and general use. Men's and women's sizes.



ERCOLINA UPPER BODY POWER MACHINE

NEW for 2009 Magnetic Ercolina Upper Body Power machine is a fantastic poling simulator that is easy to set up, use and adjust. It simulates the poling motion with two independent cords attached to magnetic brakes that offer variable resistance. Each side is operated independently and the resistance is set individually for each arm. The width between the cords is easily adjusted by hand without tools.





Boulder Nordic Sport has an unbelievable line-up of camps and clinics that offer an exciting way to rapidly improve your knowledge and ability. Whether it is an afternoon clinic at your local ski trails or a ten-day adventure in New Zealand, we immerse you in the skiing lifestyle with experts who share their experience with you in a variety of fun, enlightening ways. The result is that you end up with a wealth of information, ideas and energy to apply to your skiing.

Our events generally focus on technique development with a strong emphasis on providing the information our clients seek about training, equipment, waxing, etc. We help you learn how to balance your passion for the sport with real-life demands and get the most out of your skiing.

Our camp schedule is reduced this year because we need to focus resources on the Olympics and launching Holmenkol and Ski*Go, but we will go to New Zealand in 2010 and we are already lining up some amazing trips for 2010-2011.

See BOULDERNORDIC.COM for technique tips and go on-line 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.

**YOU CAN REGISTER ONLINE AT
BOULDERNORDICSPORT.COM**

**BNS TRAINING GROUP
DECEMBER 1 – MARCH 1**

**NEW ZEALAND ON-SNOW CAMP
JULY 19-23, 2010 AND JULY 19-28, 2010**

The New Zealand on-snow camp immerses participants in the skiing lifestyle with 5 or 11 days of top-notch cross-country ski coaching at snow at 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 go ski!

**RAMSAU, 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.

**OSLO 2011 WORLD CHAMPIONSHIPS
FEB 24-MAR 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
MAR 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.

**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.



COACHING

There is a vast drought of educational resources about technique, training and preparation for cross-country skiing. 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. Athletes tend to improve dramatically in the first year with a good coach. Much of that can be attributed to becoming serious enough to hire a coach, but a significant portion of the improvement comes from the huge gains that intelligent, focused preparation bring. To the right are some of the common areas we've found where skiers can typically make large gains:

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

TRAINING TIPS

PLAN. Establish goals and plan specifically how to achieve them. Once you have a plan, all you have to do is execute, there is no need to figure out what to do and it becomes harder to procrastinate. This gives you confidence and stability in your preparation.

PERIODIZATION. Periodization is adjusting the training stimulus to maximize the benefits of each workout and recovery. Don't train the same every day. Learn how to alter the intensity of workouts and time your recovery to optimize your body's response to training stimuli.

STRENGTH & ROLLERSKIING. Balance & Strength are two of the biggest weaknesses in most North American skiers. Core strength is vital because it holds the body in position and provides a stable platform for the extremities to push. Rollerskiing in the summer and fall dramatically improves balance and specific strength.

TECHNIQUE. It's hugely important, but should not take away from other training. Spring and Summer are the best times to work on technique. Focus on a single element in short bursts, then once you have mastered that isolated issue, move onto the next.



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FEATURED BRANDS



HOLMENKOL®

SKI*GO



SWIX



MADSHUS



CRAFT



SALOMON

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