



## Chapter 11: Waxing

To new BKL members, waxing can seem intimidating, but it doesn't have to be. We have broken down the basics for you here and included an in depth look at classic kick waxing. To start, you should know there are two broad categories of cross country ski wax: kick wax and glide wax.

**Please note that as of June 2020, all NENSA events, including BKL races and the Festival, are fluoro-free. Please see the BKL Wax Policy below (updated 12/2021)**

In an effort to lessen the cost barrier and to keep the focus more on skiing rather than on waxing at the Bill Koch Youth Ski League (BKL) level, the BKL District Chair Committee has voted to only allow basic block/hot wax or liquid paraffin wax at Eastern BKL ski races including the Festival. Please see the following list of allowed Swix and Toko block/hot wax and liquid paraffins. Please note that equivalent base line block/hot waxes and liquid paraffins from other wax companies are also allowed despite not being listed below. We appreciate everyone's cooperation in following this new guidance.

[Swix Performance Speed \(PS\) Block Wax Line](#) (formerly the CH line)

[Swix CH liquid line](#)

[Toko Base Performance liquid paraffin](#)

[Toko Base Performance Hot Wax](#)

And equivalent base line block/hot waxes and liquid paraffins from other wax companies

### Application Videos:

**Swix:** [Applying block glide wax](#)

(<https://www.swixsport.com/en/tips/swixschool/nordic-racing/apply-glide-wax/>)

**Swix:** [Applying liquid glide wax](#)

(<https://www.swixsport.com/en/tips/swixschool/nordic-racing/apply-liquid-wax/>)

**Toko:** [Applying Toko Base Performance Liquid Paraffins](#)

(<https://tokous.com/applying-toko-base-performance-liquid-paraffin-for-nordic-ski-training-regular-skiing/>)

**Kick Wax:** Kick wax allows the skis to grip the snow during the kick phase so children can push off and propel themselves forward. Kick wax has to grip during the kick phase and glide during the glide phase of classical skiing. When a ski with the correct wax is kicked down onto snow, the points of the snow crystals stick into the wax. This temporary bonding, or grip, allows the child to push off without slipping. The ski glides when the waxed part of the ski (the kick zone or wax pocket) isn't flexed onto the snow and force of the forward sliding ski is too great for the wax-snow bond to form. Different kick waxes work in different temperatures and snow conditions. Klister is a special kick wax used when snow has been transformed by weather. Because old or wet snow has rounded crystals, wax must be soft enough to allow the smoothed



snow crystals to stick. Klister is as soft as toothpaste (but way stickier) and comes in toothpaste-like tubes.

**Glide Wax:** Glide wax minimizes the friction between the snow and the base of the ski and is used on the full length of a skate ski and on the sections of a classic ski outside the kick zone. In all except the coldest snow, friction creates a microscopic water layer between the ski base and the snow by melting the upper part of each snow crystal that the ski touches. The ski glides on the thinnest layer of water between the snow and the ski base, just like a hockey skate glides on a thin layer of water between the ice and the skate blade.

### **Basic Waxing Guidelines**

**The Preparation of Ski Bases:** Modern skis have polyethylene bases. Over time, especially when used in dirty snow or when left to sit for a long time without storage wax, ski bases collect dirt. Cleaning will prevent grit from being waxed into the base of the ski. Skis can be cleaned by glide waxing with a warm-temperature wax and scraping while the wax is still warm. Also, many companies make liquid wax removers/base cleaners that will clean your bases.

**Glide Waxing:** Glide wax, like kick wax, is tailored to temperature and snow conditions although having the right glide wax for the conditions is not as important as having the right kick wax. To glide wax with block wax you will need block glide wax, an iron, plastic scraper, nylon brush, a wax bench, and a tarp (to collect the wax shavings). Instead of a wax bench you can use saw horses or two chairs with a tarp beneath but waxing and scraping will be much easier if you have vises or a wax bench to secure the skis to. Most ski centers have wax benches for public use. In addition to block glide waxes, most wax brands now offer liquid glide waxes although it is recommended to still glide wax with block wax every so often.

### **Some important block glide waxing tips:**

1. Do your work in a well-ventilated area, and dispose of your wax shavings in the trash (do not dump them outside).
2. Use an iron to melt glide wax onto the ski. Make sure that the iron is at a low temperature (most glide wax containers will tell you what temperature to set the iron to for that particular wax); **Caution:** If the iron is smoking it is too hot! Repeatedly hold the wax to the base of the iron and then rub the melted/warmed end onto the ski base.
3. Move the iron slowly down the length of the ski, but not so slowly that the iron overheats the base. Occasionally feel the top of the ski, particularly at the tip and tail where the ski's core material is thinnest, to see if the iron is heating through the ski. Heat the wax on the base until it is melted and evenly covering the base.
4. Let the ski sit until the wax is cool to the touch.



5. Scrape with a plastic scraper. Make flat, steady passes from tip to tail using even pressure. Scrape until no more wax comes off. Be sure to clean out the grooves using a plastic groove tool. Don't forget to remove any wax that may have dripped down the sides of the ski (sidewalls).
6. Brush with a nylon bristle brush until the base shines— brush from tip to tail.

It requires practice to learn to glide wax. A good way to learn is to watch someone else. Watch an experienced waxer at a ski center or have someone put on a wax clinic as a club learning activity. You can also assist experienced waxers and when in doubt, ask questions!

Glide waxing instructional video from NENSA sponsor, the Craftsbury Outdoor Center:  
<https://www.youtube.com/watch?v=ogIjhpiKNDo>

**Kick Waxing:** A basic kick wax kit contains the following: several types of hard wax and klister wax, a cork, and a scraper. A torch or heat gun is useful for heating klister so that it spreads easier. Also, a plastic applicator can be useful for those who prefer not to spread klister with their thumb and palm.

1. Start with a clean ski base.
2. Select the wax of the day, according to snow type, temperature, and track conditions.
3. To apply hard waxes, strip the metal or plastic covering of the container back around the top edge; to open a klister tube, unscrew the top and use the sharp point at the top of the cap to puncture the mouth of the tube.
4. Wax in layers. Wax lasts longer if it is layered. Lightly crayon on the hard wax onto the ski base. Wax about 45 centimeters of the area under the foot, from under the heel towards the toe of the binding (or wax your marked kick/wax pocket if you've determined that). A wax job will last longer if you start with a first layer of kick wax binder or a wax one or two steps colder than the wax of the day. See Marking Wax/Kick pockets below on page 141.
5. To apply klister, squeeze out a line of klister dots, or angled lines, along the 45 cm base area or wax/kick pocket. Smooth out with your finger/thumb/palm or plastic applicator provided in the klister box.
6. To rub in hard wax, use a light steady cork stroke cork to buff and smooth the wax.
7. If waxing indoors, allow the waxed ski to adjust to the temperature outside before use otherwise icing may occur when the ski first touches the snow.
8. Ski a short distance in order to check the wax. Once you start skiing, give the wax several hundred meters to start working. If snow builds up under the ski, scrape it off and apply the next colder, harder wax. If you are slipping, you can do one of the following:
  - a. Thicken the wax



- b. Lengthen the wax pocket
- c. Use the next warmer wax on the temperature scale.

Kick waxing instructional video from NENSA sponsor, the Craftsbury Outdoor Center: <https://www.youtube.com/watch?v=TmqycGpeLho>.

**Klister:** Klister is used when the water content of the snow is very high or the snow has thawed and refrozen. Try to wax indoors with klister whenever possible; this wax applies best when warm. If you have to apply the klister outside, heat the klister tube with a torch or heat gun, or warm it with your hands.

To apply klister, put tiny dots or angled lines every five to eight centimeters on the middle half of the ski avoiding the groove. Smooth it first with your thumb/palm/finger or klister applicator. Then heat it with a torch or heat gun and smooth it into a thin and even layer. Be careful not to heat the klister to the point of smoking which causes a chemical change that diminishes the wax quality. If you do not have a torch or heat gun, spread the klister with the applicator from your wax kit and then further smoothen the klister with the palm of your hand. Cool your skis outside before use.

Klister waxing instructional video from NENSA sponsor, the Craftsbury Outdoor Center: <https://www.youtube.com/watch?v=DPyGzgmzCV8>.

**Cleaning:** It is often possible to ski on the previous day's wax. However, if snow conditions or the temperature has changed, then clean skis before rewaxing. Start by scraping off as much wax as you can without harming the ski base (a klister applicator or putty knife is ideal). Use wax remover or a torch/heatgun and rag to finish cleaning your skis. Be sure to keep the torch/heat gun moving at all times otherwise you might burn the ski base. Be sure to scrape the wax from the sidewalls of your skis as well. Check whether the ski is clean by seeing if you can leave a fingerprint on the previously waxed surface.

**Marking Wax/Kick Pockets** (an excerpt from Andrew Gardener's "Testing the fit of new or cold classical skis"): The Swix-recommended method of finding the kick zone requires a friend, a very flat surface and a piece of normal typing paper (they suggest A4, 60 gram paper, but any fairly normal typing paper will do). Place the paper under the ski and stand with the body-weight equally distributed on both skis. For all these tests you must stand with your feet on the ski where they would be if you were skiing on them on the bindings. Have the friend move the sheet of paper towards the tip. At the point where the movement comes to a stop, mark with a pen on the sidewalls. This point represents the forward front of the kick zone for cold, dry snow conditions (hard kick waxes such as VR 40 or Extra Blue). Next, fold the paper



once and repeat the process. Where the paper stops represents the forward front of the kick zone on freezing point conditions (soft kick waxes such as VR 60 or a red kick wax). Finally, fold the paper once more so that it is 4 times its original thickness. Repeat the process by moving the paper as far forward as possible. This time the stopping point represents the front of the kick zone when using klister. The rear of the kick zone normally ranges from under the middle of the foot back to the heel of the boot. Very, very seldom does the kick zone extend beyond the rear of the heel. Often a klister kick zone will stop under the mid-foot while a hard wax kick zone will extend back to the rear of the heel.

**Conclusion:** There are certain basic steps to follow when learning to wax. With time, your growing knowledge of waxing, combined with an increasing awareness of you or your child's own style of skiing, will lead to rewarding results.



## **Classic Kick Waxing: A Simplified Approach**

by Fred Griffin, Northeast Nordic Ski Club

Waxing for classical skiing is 90% science and 10% intuition. The intuition is informed by experience. But make no mistake—there are no shortcuts, no magic pills, no substitutes for *doing*. Classical waxing is in fact the perfect embodiment of the BKL teaching methodology, “Learning by Doing.” The more you wax the better you get.

### **I. Factors Influencing Wax Selection:**

1. Snow Quality
  - Fresh fallen/ not transformed (*binder and kick wax*)
  - Partially transformed/been subject to some freeze-and-thaw (*try binder and kick wax, then go to klister and/or klister covered with kick wax*)
  - Transformed/artificial/ ice-like rather than flake-like (*binder and klister*)
  - Abrasiveness (*determines how many layers of kick wax and type of binder; determines whether you need a klister binder*)
2. Snow Temperature and, to a lesser degree, Air Temperature determine the waxes you use for testing
3. Humidity: Greater humidity means tracks glaze more quickly and you generally move to a warmer wax than the temperature indicates; if there is very little humidity and the snow is dry, you might need a cooler wax than the temperature indicates.

**II. Wax Selection:** Wax selection is a wonderful example of the scientific method in action. Arrive at the race site and be ready to start testing two hours before the first racer goes off. Gather data then read labels, factor in the variables above, and:

1. Pull out 4, 5, 6, or more kick waxes or klister that seem to fit the criteria
2. Have a minimum of 4-6 skis, ( 2-3 pairs) with which to test
3. Apply different waxes to different skis. Use a sharpie and tape to indicate what you have put on which ski. Send testers out to test. No less than ten minutes—ski the wax in!
4. Discard waxes that aren't working. Test those that are working to varying degrees against each other. Look at waxes you haven't tested but come close to matching the profile of what seems to be working. Maybe try a few of them.
5. Zero in on what is working best; keep an eye on weather conditions and track conditions. Have your bailout waxes lined up and ready to go—something colder if the kids start dragging and something warmer if they start slipping. Know where you are going to go ahead of time if you are forced to make a change.
6. If you feel pretty certain the wax is the right wax but your child complains, go longer in application, then go thicker in application before moving to the warmer wax.



7. Always, always, always exude relaxed confidence. "I want you to be happy with your wax. Let me know if it's not like you want it and we'll fix it!" When you get tight and panicky kids' anxiety levels red line.

### **III. Wax Application**

1. Have kick zones accurately marked (paper test as described under Marking Wax/Kick Pockets on page 141); keep in mind that klisters zones will be 1 1/2 inches shorter on average.
2. Have kick zones sanded with +/- 180 grit sandpaper.
3. Binder wax or binder klisters goes on thin! Just thick enough to cover the hairies raised by the sanding; heat with iron and smooth with cork or hand.
4. Subsequent coats of kick wax go on thin and are corked until smooth; klisters goes on thin and is corked or hand rubbed until smooth.
5. Know your kids and know their skis. Inexperienced children may want/need warmer wax than children with better technique. Children with stiff skis may need longer and thicker applications.
6. Wax zones are not constants. In general, cold dry weather lengthens the kick zone and makes thinness of application more important. Warm wet weather shrinks the kick zone and may require a thicker application.