

A Trip to Lie Nielsen

By Rick McGill



Just mentioning the name "Lie Nielsen" to the serious woodworker and many words come to mind: "great quality;" "pricey hand tools but worth the every penny;" "superb tools...wish I could afford more." I, like many of you, that may have some of their tools or may have used them in times past can identify with these words. Personally, I own several of their tools and know that they were designed with the philosophy of "built to last" and with good care they will last many years. Thomas Lie-Nielsen agrees as well and that's why he offers a lifetime warranty on them! I had the great pleasure of touring the facilities at Lie-Nielsen to get a first-hand experience of the craftsmanship that goes into the making of their tools and it was a great experience hence the reason of sharing the experience with the club members. Their facility is comprised of a showroom; an assembly room for tool inspection, packaging and shipping and, of course, numerous facilities for machining their tools.

Upon entering the showroom, you are likely to encounter Ted Dishner. Ted wears many hats at LN. First, Ted is responsible for customer service for those that have questions on use for the many tools that LN makes or if you aren't sure which tool might work best for your woodworking job, Ted could probably assist you in proper tool selection. Ted also demonstrates any of the tools available at LN and believe me there are numerous ones available in the showroom. I overheard a customer ask Ted for a bib and Ted's response was "Sir, we don't have bibs" and the customer responded with "Well, you should because I am drooling all over myself in here..." I couldn't help but laugh but the little kid in me probably agreed! You will also likely to find Ted doing product testing in the showroom as well. I witnessed multiple tests with some of their handsaws and several planes. Ted is also responsible for shop tours and thanks to him you can experience some of that through the attached photographs.



Ted Dishner in the showroom

A Trip to Lie Nielsen

By Rick McGill



The building that houses the machining operations is brand new and quite spacious compared to the previous facilities. As you might expect, the machining operations consist of a large number of CNC milling machines, an array of equipment for drilling, tapping, boring, lapping and surface grinding. The majority of the milling operations are automated but automation is strictly supervised by highly skilled machinists that pay close attentive detail to the quality of the operation being performed. I got a chance to witness many operations in progress.



Castings for Block Planes

I was first directed to the area for the castings bin to observe the many flavors of plane bodies that were currently in production. LN uses two types of materials for their plane bodies; bronze and cast iron. The bronze castings are made in New Hampshire and the iron in Lewiston, Maine. The castings are first visually inspected for any defects then taken to the surface preparation area for material removal and detail surface milling operations. These operations are repeated until the plane bodies meet specification tolerances then additional surface inspections are performed to ensure proper quality then the plane bodies are arranged in boxes for later assembly.



Rough milling



Surface milling on #8



Surface milling on #4

I got to witness the precise milling operations used for both the number 8 and number 4 planes. For those of you that don't know, LN bench planes are modeled after the vintage Stanley Bedrock planes and certain types of these planes (smoothers, jack, and joiners) were numbered from 1 to 8. The numbers are relative to the size of plane. The smoother planes are classified as #1 through #4 1/2; the jack planes #5 -5 1/2; and the joiners are #6 through #8.

A Trip to Lie Nielsen

By Rick McGill

I next observed the grinding and milling operations of the steel used for the plane blades. LN uses A-2 steel for all their plane blades. Prior to milling, the A-2 steel is hardened to Rockwell 60-62, cryogenically treated and double tempered. The cryogenic treatment or "deep freezing" is done to ensure that the Carbon/Iron alloy structure formed is all Martensite. The heat treatment ensures that the blade will take and hold a very fine edge for a long time. After heat treating, the blade is fully surface ground on the top, back, and cutting edge, giving a smooth, flat surface that will take a mirror finish very quickly. Some of the final lapping on the blades is done by hand which adds more of a "personal" touch to the quality of the product. The blades are then placed in boxes and ready for later assembly.



Milling machines and plenty of workspace!



Batch Milling Plane Blades



Surface prepping a blade



Plane blades ready for heat treatment



Ovens for heat treatment



Polishing post heat treatment to remove discolorations



Deep-freezing unit for cryogenic treatment



Rockwell hardness testing on the plane blades

A Trip to Lie Nielsen

By Rick McGill



Chisel before final milling

I next got to observe the steps involved in chisel milling. This process was the most automated, as you might expect. There were two different CNC operations performed to make the chisels. The first involved a multi-head lathe cutter for gross milling then the second CNC performed the angle cutting and bevel milling operations. One machinist was responsible for both operations. After the bevel operations, additional surface grinding was done by automated lapping machines then the final lapping was done manually. The chisels are hand lapped to 400 grit. After lapping, the handles are attached to the chisels. The handles are made from Hornbeam, an indigenous Maine hardwood with properties similar to maple. The final quality control testing is performed on each chisel by striking 12 times with a wooden mallet. After this testing, the chisels are visually inspected for defects then boxed for assembly. LN started making chisels about a year and a half or so ago and the demands for them have been considerably high. Ted informed me that there was at least a four week wait on chisels at the current time.



Lathe feeder for automation



Multi-head lathe cutter



CNC used for angle cutting and bevel milling



Automated and manual lapping on chisels post milling



Final hand lapping to 400 grit



Chisels ready for handle assembly



Finished product!



A Trip to Lie Nielsen

By Rick McGill



Next, I was led to the assembly room to observe the very well organized process of part assembly for all the planes. There are many parts in a single plane and you would have to witness the assembly operation to appreciate the details of how this room was arranged. There were numerous bins for small parts and ample space for proper assembly and packing. The shipping was also located near the assembly and packing, in efforts to streamline these operations.



Plane assembly



Assembled planes ready for final polishing and packaging



Planes being packaged



Shipping operations...to some happy customers!

A Trip to Lie Nielsen
By Rick McGill



Vintage cabinet makers bench

Lastly, I spent time browsing through the showroom to "test drive" several planes, marking gauges, spoke shaves, hand saws and observe the LN workbenches. Yes, LN also makes workbenches, although I have never seen one in a woodworking retail store. The current wait time for a bench is over four months because of the current demand from Marc Adams Woodworking School. As you would expect from LN, the benches are very high quality and there was no skimping on the bench hardware.



LN bench planes all in a row!



Hand saws ready for trial



Examples of Lie Nielsen workbenches

Lie Nielsen Toolworks is located on Route 1 in Warren, ME. It is approximately 1 3/4 hours from Portland, ME. If you plan a trip there you can drop your spouse in nearby Bar Harbor (25 min) or Freeport (40 min) for endless shopping. Also, for nearby dining, you should try the Silver Lane Bistro (.5 miles from LN; <http://www.silverlanebistro.com>) for dinner but be sure to make reservations. Or, for breakfast or lunch, you could try the famous Moody's Diner (5 Minutes south of LN; www.moodysdiner.com) for an interesting experience.



Other LN tools



Ebonizing Walnut *by Rick McGill*



African Ebony (*Diospyros crassiflora*) is a tropical hardwood species that is typically used for musical instrument inlays, handles, pulls or as an inlay wood to create contrast with other woods. It is rarely used for a complete project, primarily because of the high cost (>\$25 board foot on average) and limited supply. It is also listed as an endangered species. This article provides an alternative use for ebony and the end result is significantly cheaper, simple for the do-it-yourself types and almost visually identical with respect to color and contrast. One can make an ebonizing solution from common household items. For this project you will need the following:

- Steel wool
- Vinegar
- Mixing container with lid (plastic)
- Gloves
- Safety glasses
- Paint strainer of similar filter material

First, place the steel wool in the container and completely submerge the steel wool with vinegar. Place the lid on the solution and let it sit for a minimum of 48 hours. The solution will darken over time and the steel wool will partially dissolve. If the solution is not very dark then let it sit for a longer period until it turns pretty dark. I found that about 5 days works pretty well. Next, filter the solution with the strainer and it is ready to use. You should use gloves and safety glasses during the fluid handling. The filtered solution can then be wiped on or brushed on. I found that I got the best results by wiping on small amounts, removing the excess and then observe the change. I found that on my experimental pieces the color change was almost immediate in some cases and in others it took 30 seconds or more to observe the reaction. Once you get the desired color, be sure to wipe off any excess solution to halt the reaction. As with all stains, one should test with samples of the project wood prior to applying the stain. After staining you can alter the clarity by applying Tung oil. I used Tung oil for my project and was quite happy with the results. The solution can be stored for later use. I haven't experimented enough to know the expected shelf life of the solution. The picture below shows an example of a project that I completed where I used the ebonizing process on the handles. The handles and the cabinet doors are both birds-eye walnut. I wanted the handles to be darker than the doors for contrasting visual appearance. The results are pretty obvious.



Handles



Cabinet