

Applying and Curing Traditional Japanning Finishes



This japanning mixture is based on research into traditional Japan black finishes for cast iron products as applied in the late 1800 and early 1900s and results in a durable rich glossy finish closely matching original japanning. The procedures described here are designed to help someone new to the process succeed in obtaining an original Japan black finish on cast iron. This is a conservative approach that seeks to balance efficiency while minimizing risk of flaws that result in a complete disaster. It is possible to achieve good results using faster heating cycles, but with greater risk. As I point out in *“Japanning 103, Traditional Japanning, The Black Hole of Finishes”*, and you may have discovered in preparing your plane, stripping old japanning and cleaning rust off surfaces to be japanned is slow, tedious, miserable work (without an expensive media blasting setup). My goal is to protect you from having to repeat this process due to a failure in your application and curing of new japanning. This conservative approach to japanning is designed to ensure your success.

Japanning cast iron is 49% product and 51% technique. You will have to develop techniques that help you achieve success. This article will provide a starting point for success by providing the tips and techniques that have worked for me.

This insert provides information on the application and heat curing of the Japan black finish or ‘japanning’. It is an excerpt from the full “bench guide” I wrote on traditional japanning of cast iron planes that covers plane preparation, Japan black mixing and filtering, and the application and heat curing of japanning. There is also a trouble shooting section at the end of the full bench guide.

The full bench guide can be found in the BLOGS section of the website titled: *“Japanning 103, Traditional Japanning, The Black Hole of Finishes”*

Here is a link to the full article: <https://aplanelife.us/blogs/f/japanning-103-traditional-japanning-the-black-hole-of-finishes>

There is also a 30-minute video on applying and heat curing japanning titled, *“Japanning Instructional Series - Session 3, Applying and Heat Curing Japanning”*, on the website. Here is a link to the video series:

<https://aplanelife.us/videos>

Remember:

Always let the japanning sit, undisturbed, at room temperature for 24 hours prior to use. Any contaminates remaining after filtration should be allowed to settle after stirring, shaking or the jostling of shipment.

Materials List

- Japan black mixture
- Acetone for surface prep (turpentine may be used but takes longer to evaporate)
- High quality ¼" to ½" wide, ½" long or shorter artist's brush
- Toaster oven for heat curing (at least one person has successfully cured their plane in a gas BBQ)

Preparation

All parts being japanned must be completely cleaned of rust, old japanning, and any dirt, oil, or other contaminants. First remove all dust, grease, sawdust, etc. Washing the parts using dishwashing detergent or commercial parts degreaser will suffice. If you are not going to immediately begin removing the japanning, thoroughly dry the parts to prevent adding to existing rust.

Next remove any remaining old japanning. My preferred method for removing old japanning is bead blasting with 80grit glass beads at 20-60psi. This can be done with no effect on the cast iron with little chance of damaging the casting. Walnut shell abrasive or corn cob abrasive will also work with no risk of damaging the cast iron but is considerably slower. If that is not an option, a Dremel rotary type tool with an assortment of wire wheels and cups is effective. Wear safety glasses as the japanning will flake off. Lacquer thinner will quickly soften japanning allowing it to be scraped and brushed off using plastic and nylon tools. When done with some care these methods will not harm the cast iron.

After removing the old japanning the parts should be cleaned with turpentine, then wiped down with acetone just prior to application of japanning. Use care not to touch any surface that will be japanned with your bare hands as the oil from your hands can interfere with the japanning to metal bond. Work in a room temperature, dust free environment. Uncured japanning is very sticky, and any debris will adhere to the surface like flypaper. Once baked in, the pieces of sawdust, eyelashes and brush fibers are a permanent part of your restored hand plane.

Apply First Coat of Japanning

Your japanning mixture and hand plane MUST be at least 72°F (23°C) for the japanning to self-level. Warmer is better. Let me emphasize this point. If your japanning is too thick, usually due to temperature, it will not self-level, regardless of how long you wait! There is a "window of opportunity" for self-leveling, after about 15 minutes, the japanning begins to skim-over, and self-leveling slows significantly. Thick japanning will stop self-leveling at this point, potentially leaving you with brush marks, at best, and at worst, an uneven surface that is virtually impossible to correct. While you shop may not be warm enough, you can store your japanning at the proper temperature and warm the plane to 80-90°F (27°C-32°C) prior to applying the japanning. If your japanning mixture is still too thick to easily saturate your brush at this temperature, it needs to be thinned with either turpentine or boiled linseed oil. Turpentine thins faster. Adding turpentine repeatedly over time will reduce the ratio of boiled

linseed oil reducing the final hardness of your mixture. I suggest mixing a 50/50 ration of turpentine and boiled linseed oil, then using this mixture to thin the japanning. Your mixture will thin quickly, especially if you are working with a small, ¼ pint, quantity. Start by adding ¼ teaspoon of thinner, stir and examine the viscosity. Adjust from there. Remember, it is best to allow japanning to rest for 72 hours at room temperature prior to use after any stirring or shaking.

Work in a dust free environment! Any dust or foreign material that lands on your uncured japanning will become a permanent part of your plane. Avoid the heartache and avoid any dusty area when japanning.

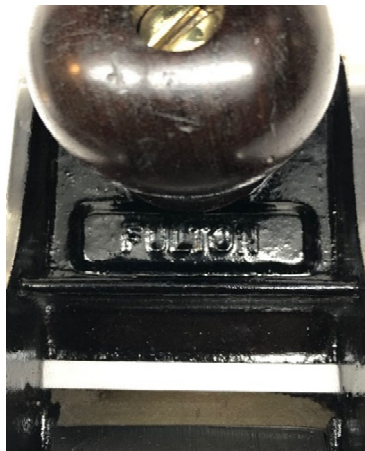
Using a quality ¼' to ½" wide ½' long or shorter artist's brush, apply a thin layer to all horizontal and vertical surfaces you want japanned in one application. If japanning a block plane lever cap, you will have to japan the underside first, complete the entire japanning process on the underside, then begin the side that will be displayed. The first coat of japanning should appear somewhat brown, not black. If your application is black, it may be too thick and could sag during curing. Simply continue to brush it out until you have a brown, somewhat translucent covering. For the first coat it is better to apply too thin rather than too thick resulting in runs and sags. After application of the first coat, allow the parts to sit for 20 minutes to 30 minutes in the unheated oven (it is a good dust free area) and the japanning will self-level to a uniform smooth finish at room temperature.



Heat Curing

Heat curing is required before adding additional coats of japanning or the japanning will become difficult to cure. Always begin with a cold oven. I suggest using an oven safe digital thermometer to monitor your oven temperature. Place the japanned parts in the cold oven. Heat the parts to 180^o-190^of (83^o-88^oc) and hold at temperature for 2 hours. Allow to cool completely in the oven. Repeat this heating process a second time, however once the initial temperature of 180^o-190^of (83^o-88^oc) is reached, slowly increase the temperature over the course of 20 minutes to a final temperature of 375^o-400^of (190^o-205^oc) and cure for 2 hours at this temperature. Allow to cool completely in the oven. Remove and

apply additional coats of japanning as desired, heat curing between coats as before. Repeat this process until the desired depth of japanning and color are achieved.



Trouble Shooting

As far as troubleshooting your finish, here are some of the issues I have encountered and what I believe are the underlying causes and solutions:

- Specks or other contaminants in finish. Cured japanning makes an excellent 'sandable primer' and small imperfections can be easily sanded flat then another coat of japanning added. I recommend 800-1000 grit sandpaper. After sanding, wipe with turpentine prior to applying the next coat.

- Mixture has thickened while left on shelf for several months. Thin with a 50/50 mixture of turpentine/boiled linseed oil and allow to rest 72 hours prior to use. In the future, either use argon gas to remove oxygen from the can (aerosol can of wine preservative available online) or raise the level of japanning in the can as you use it up by adding clean marbles to the can.
- Finish is still tacky, or soft enough to leave an impression with a fingernail. Repeat the final heat curing cycle increasing the temperature by 25⁰f (4⁰c) above your previous final temperature, ensure your oven is reaching the recommended final curing temperature. Continue to increase temperature on subsequent heating cycles to a maximum of 400⁰f (205⁰c) until desired hardness is achieved. If the japanning is still not hard, your mixture is no longer useful, the boiled linseed oil ratio is too low or it has polymerized in the can and is no longer curing after application. Stripping and restarting may be the best course of action. You can try longer curing cycles or fresh japanning over the existing soft coat to try to salvage the work. Why not just heat to 400⁰f (205⁰c) to being with? See next paragraph for the risk of overheating.
- Bubbling along the cheek/plane bed or in general on the surface. The japanning was either applied too thick or the plane was heated too quickly to too high of a temperature. Bubbles or blisters are caused by the japanning forming a cured skin before the turpentine as escaped from the underlying material. The trapped volatile organic compounds will cause blistering as they try to escape from the uncured japanning underneath. This is a fatal flaw and the plane must be stripped and re-japanned. Apply multiple thinner coats.

Please share your experiences, successes, failures, improvements, alternatives and, most of all, pictures, with me at aPlaneLife@comcast.net. I look forward to hearing from you and seeing your restored planes.