

## Fundamentals of Blind and Gold Tooling on Leather

### Fundamentals of blind tooling and gold tooling, using shellac glaire<sup>1</sup>:

Gold tooling is notorious for being difficult and the goal of this process is to break through that. In my opinion, line-work is one of the most important, fundamental, and versatile decorative techniques used on tooled bindings (the most important, titling, will not be covered here). This handout contains one of the many techniques for gold tooling on leather. It is the technique that I find the most approachable for beginners, and can give truly stunning results. Lines can be used to create the simplest designs as well as extremely complex in both traditional compositions and contemporary design bindings. In all applications, lines are tooled one line at a time.

There are several methods for adhering metal leaf to a binding. Here we will focus *only* on building up a blind impression, applying glaire, picking the gold up on the face of the tool, and tooling with gold leaf into the already made impression on a high-quality vegetable tanned leather. For this kind of tooling, and for almost all others, being able to go back into an impression is of the utmost importance.

For ease of reference, this top page has the progression step by step:

1. Affix your template to the leather and tool through it with a heated tool
2. Remove your template carefully
3. Blind tool with a heated tool
4. Add moisture and tool with no heat
5. Add moisture and tool with a heated tool
6. Glaire in your line twice, allowing the glaire to dry after each coat
7. Pick up gold on a hot tool and tool your line
8. Gently fold excess gold over the impression and retool
9. Re-tool your line with gold until there are no breaks in the gold
10. Wipe off any excess gold
11. Clean the walls of the impression with an “orange stick” or with a dull leg of a divider
12. Burnish your impression by going back into the impression with a warmed tool, well below the gilding size’s activation point, and subtly rock the tool in all directions

\*When tooling without a template:

1. Mark up your line
2. Blind tool your line with no heat, remembering to clean the face of the tool before each impression  
-Proceed from 3 on the above order of operations

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<sup>1</sup> The term “glaire” refers to the size for gold tooling or edge gilding traditionally made from the whites of eggs. Here we are using blonde shellac glaire, which is only related to egg glaire in that it is a size used to adhere metal leaf to a covering material. “Glaire” within the context of this handout refers only to shellac glaire.

## Finishing

The four material factors that you will have to be mindful of are:

**Heat** of the tool, gauged by the sizzle of the cooling pad after removing the tool from the stove.

**Moisture** content of the leather, which has two main factors: the amount of moisture added by sponge or cotton and the relative humidity of the room.

**Pressure** used in each tooling impression.

**Dwell time**, which is the amount of time the tool is in the impression (with shellac glaire your impression should be short, sharp, and confident).

Secondary factors are physiological and psychological:

**Practice!** The most important piece of advice that anyone can give about finishing.

**Confidence** shows in the result. Work up your confidence through practice, and when in doubt, fake it.

**Remain Calm-** Just as with other binding operations, when you make a mistake, don't panic. Relax and approach the problem with a clear head.

**Focus-** Especially when you are building your skills, block out any peripheral distractions.

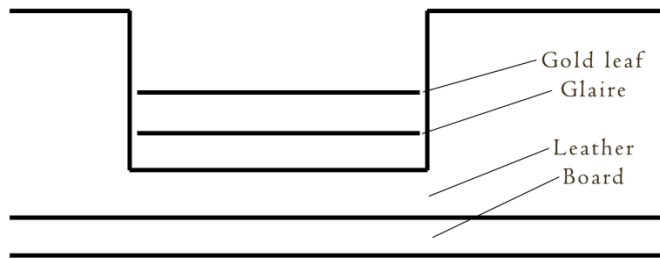
Finishing tools are generally made of brass or bronze, with shanks set into wooden handles, and used to impress their design onto a book for some decorative purpose. For this handout, we will be focusing on proficiency with line pallets as a means to decorate leather, and then move onto decorative tools. Different finishing tools have different surface areas, and what is significant about this is the correlation between surface area of the tool and the pressure needed to make your impression, e.g. you wouldn't want to use the same pressure for a dot as you would for a 30 square millimeter decorative tool as it would make a hole in your leather and probably the board; and the same is true for larger and smaller pieces of line.

### Understanding the impression:

"Blind tooling" is making an impression with a tool into leather which you can build up in stages to make the impression permanent, with the final step being tooling dampened out leather and a heated tool.

Once that impression has been built up, glaire is applied to the bottom of the impression, allowed to dry, applied again, then tooled with gold that has been picked up on the tool.

The following diagram is a cross-section of what an impression can be. The impression should be crisp (well defined) and somewhat shallow so that the light will reflect off of it and not get lost in the walls of the impression. You want the glaire to sit at the bottom of the impression, which is where you want the gold to be; if the gold sticks to the walls of the impression, your gilding can look fuzzy, a confident, short dwell-time at the correct temperature and pressure will result in a successfully gilt impression.



**Sighting:** I fall into the “English sighting” category, which has one’s body positioned over the tool. I prefer this over the “French sighting” which has the tool in front of you while seated—not because one is better than the other, but because I learned it that way and I feel there is less strain put on the wrist. Pallets are made with one flat side and one beveled side. The flat side allows for visibility and it is the side you will sight with, looking down at the left side of the tool. You should be able to see where you are tooling, and you want to keep in mind what is behind where you are tooling, where you are actually tooling, and where you will be tooling (where the line is headed). One thing that ought to be mentioned is that once you have made the initial impression and it is where it should be, touch is just as important as sight—making sure that you feel the tool in the impression as you are tooling. When tooling a line next to the board edge, I always work clockwise, using the board edge as reference.

To sight a decorative tool, your line of sight is over the top of the tool. Decorative tools generally have a nick in the shank of the tool to be used when going back into that impression, making sure the tool is pointing the same way it was for previous impressions. I use my left thumb to guide the tool when making an impression—a leather thumb cover can be helpful for this which can be made from a piece of leather and tape, or just the thumb cut off of a leather glove, but you can also use your thumbnail or thumb once you’ve adapted to it. Gouges are sighted over the top, looking at the inside of the curve.

**Lighting:** Having correct lighting is critical when marking up and tooling. I generally have two task lights, a strong and bright light on my left and a weaker light on my right, but proper sunlight along with one task light pointed towards the sighting side of the tool works quite well. After gold is in the impression, the absence of light can be just as useful in seeing where you are going. Preferences for lighting will develop for you over the course of time and practice.

### Tools and Materials:

**Leather:** For this demonstration I am using vegetable tanned goatskin leather. Different leathers tool differently, and even different parts of a particular skin can accept tooling differently. When preparing for tooling a binding, always make a plaquette to see how the leather tools. Different thicknesses of leather will also tool differently, so it is worth spending time practicing using different thicknesses of leather. Polishing your leather before tooling will give you a nice, smooth, and compact surface which tools very well; some bindings call for keeping the character of the leather’s grain without polishing. This is another point on which you may spend time practicing on plaquettes of each to see which you prefer.

**Blonde shellac glaire:** A blonde shellac based synthetic glaire, which is heat activated. It was developed because of the resource shortage (here, eggs) as a result of the Second World War.

My shellac glaire recipe (slightly adapted from a recipe which Peter Geraty found and shared): 10 grams Borax, 30 grams blonde shellac flakes (I use #60450 shellac, very light, from Kremer pigments), and 250 mL distilled water. Dissolve the borax in nearly boiling water. Then sprinkle in the shellac and stir frequently under low heat until completely dissolved. While you do not want a rolling boil, a few “blubs” coming up from the bottom lets you know there is sufficient heat to help the shellac dissolve. When it has dissolved I pour it into a glass container. Let sit overnight and strain through a coffee filter. I would suggest getting a 2-cup saucepan to be used specifically for this purpose. Store in a cool, dark place. This will keep for years, if it becomes cloudy you can strain it through a coffee filter.

**Rapidograph pen:** For applying glaire to the leather I use a Koh-I-Noor Rapidograph pen. I use both a #1 (.50) and #2 (.60) size nib, depending on the surface area that needs to be covered. Use a light touch in applying the glaire. And always remember to clean your pen to avoid clogging, flushing it several times with water once a week or so. When storing for long periods of time, I flush my pen several times with a 50/50 isopropyl alcohol/water solution and fill the reservoir with distilled water to store.

**Gold leaf:** Leaf for tooling is almost always an alloy, as 24K gold is sometimes too soft and more difficult to handle. Generally, I don't use anything less than 22K, since it is possible for it to tarnish.

Handling gold leaf is a skill that is developed over time. There are two ways that I was taught:

-The first is a bit more approachable if you do not have experience with leaf. Open your book to a new leaf and carefully flip the book over, gently rolling the leaf onto the gold cushion. Press down on it lightly, and slowly lift the book up, which should leave your leaf on the gold cushion; then very carefully, close the book and set it down gently so as to not ruffle the book and disturb the remaining gold in the book. With your mouth a few inches directly over the leaf, make a “puh” sound to flatten the gold on the cushion. Close the gold book gently.

-The second way, which I use, is as follows. Open the gold book to a new leaf. Gently tap the clean gold knife in front of it so that the air disturbance causes the gold to fold over on itself. Place your gold knife where the folded over part *was* and lightly blow the leaf so that it is back in its original position, just with the knife under part of it. Gently pick the gold leaf up from the booklet and transfer it to the gold cushion, and rotate the blade of the gold knife out from underneath the leaf. With your mouth a few inches directly over the leaf, make a “puh” sound to flatten the gold on the cushion. Close the gold book gently.

**Gold knife:** The two factors about maintaining a gold knife that must always be observed are: (1) the gold knife must not have any grease or oil on it, and, (2) it must always have a sharp edge. Never touch your gold knife's blade, as this will deposit oil on it which will grab the gold. Whenever your gold knife is sharpened, you have to clean it off with a cotton ball with lighter fluid or mineral spirits. Also, rub it on the pumiced gold cushion frequently. You want your gold knife sharp enough to break the leaf into smaller pieces, but not sharp enough to cut through the leather of the gold cushion—a sharpening steel is a great tool for this.

**Gold cushion:** A 11" x 7" (or so) piece of plywood, with a 1cm thick stack of paper on top of it (cut just smaller than the length and width), which is then wrapped with a piece of suede, adhering it only to the sides and bottom of the wooden base with PVA. The top of the gold cushion should be sprinkled with fine pumice powder, or Bath Brick, which keeps the cushion oil free.

**Gold box:** For covering the leaf you are using when you do not need access to it. It can be made of 40pt or

any board, with the overall dimensions being 12.5cm x 12.5cm x 2cm. Take a 16.5cm x 16.5cm piece of mat board, score a line 2cm in from the edge with a pair of sharp dividers, cut out the corners, and fold the walls down, securing them with tape. You can also glue the walls together at the corners (instead of tape) and cover it with decorative paper.

**Air shield:** To aid in keeping moving air from disturbing your gold. They can be made from three or four pieces of binder's board, 7" wide by 12" tall, hinged with 2" wide strips of cloth (or tape) holding them together.

**Finishing stove:** Thermolyne student hotplates are great for this kind of tooling. Keep the stove at a relatively hot setting, and heat up the tool you are going to use when you are ready to use it. Larger stoves with tool rests are very useful with designs that you need many tools to execute or if you are using handle letters or multiple type holders. Coil hotplates work quite well, too, and are especially affordable.

**Cooling pad:** This seemingly insignificant piece of cotton is extremely important, as it gauges the temperature of your tool, making sure it is neither too hot nor too cold. I use a wad of cotton on a ceramic plate and saturate it with tap water so there is a little standing water. You can also use a sponge sitting in a shallow bowl or cup filled up halfway with water. In general, you want to cool the tool down so that it is just on the sizzle for tooling—this can vary depending on covering material and environmental aspects, which will come with experience. A quick note about a false-read; when a tool is way too hot, it can sometimes not sizzle when initially touched on the cooling pad.

**Pointed bone folder:** For marking up, you want to make sure you are using a bone folder that is the same thickness as the line you are tooling with. I use either bone or brass.

**Plastic triangle or rule:** To avoid removing material from your bone folder as well as avoiding unnecessary marks in the leather, or transfer from anything metal to the leather, use a clean plastic triangle or rule.

**Suede pad:** You should have three sections of these for polishing the face of the finishing tool before each impression whether it is in blind or tooled with gold. One is plain suede, which is used for every impression, one that has Vaseline rubbed into it for picking up gold, and one that has a little bit of honing compound (or jeweler's rouge) on it to clean any deposits off the tool's face. Do not overuse the pad with honing compound on it because it does remove metal while cleaning. Your gilt impression will only be as bright and reflective as the tool's face is clean.

## Process

**Making a Template:** When executing a design that needs it, a paper template can be used. A thin, strong paper does the trick, such as a 35gsm or so Japanese tissue, 45gsm bank paper, light Permalife, or something similar. The reason for this is that when you tool through the template, the thickness of the paper is added to the thickness of the impression, so you don't want it too thick.

When making up your pattern, lines can be drawn, and decorative tools can be inked (be sure to use an acid-free ink and clean the tools thoroughly after inking out your design). When your design is ready, it needs to be affixed to the book—generally tape with a bit of the adhesive taken off, though don't tape onto calf because it is fragile, instead you can use paste to hold it into place, or make your template oversize and wrap the excess around the board edges and tape to the inside of the board (inside your turn-ins)

**Marking up for tooling without a template:**

The initial marking up of your line will be done using a pair of dulled, but not blunt, dividers making a mark near the beginning of your line and near the end. The divider's point should be level with the leather, as you are making a slight depression in the leather—not a point or a hole. Then, using a plastic triangle or rule and a pointed bone folder, connect the two lines using a firm and steady, but not harsh, forward and back motion, starting at the point nearest to you and moving away from you, being careful to stop at or just shy of where the line will stop. Use a bone folder which has a point size the same as your line pallet.

**Blind tooling:** When tooling with a line pallet, you always want to have at least 1/3 of the tool in contact with the leather; this prevents you from digging in, which will negatively affect your tooling. Begin at the back of the tool moving it forward, and rock the tool gently from side to side to make sure the entire width of your line has definition.

Before each impression, clean the face of the tool on the plain suede pad.

- (1) Blind tool your line first with no heat
- (2) Then with a heated tool just at a sizzle
- (3) Then add moisture, wait for the leather's surface to look dry, and tool with no heat
- (4) Then add moisture, wait for the leather's surface to look dry, and tool carefully with a low heat, much lower than a sizzle. Different leathers will respond to moisture and heat differently, so it is better to tool with a tool that is too cool and work your way up than to start off at a temperature that could burn the leather. Experience will tell.

(4a) At this point, if your design is going to stay blind-tooled, use moisture and heat to bring all of the impressions to an even color.

**Continuing the line:** The best way to keep your line as straight as possible is to progress by 1/3 of the length of the tool with each impression, which is to say that you will go back into your previous impression with 2/3 of the tool. This helps keep you on track as you move forward.

**Applying size:** “Glairing in” with the Rapidograph pen is the quickest way of applying size when tooling a line using a synthetic glaire, in my opinion. When drawing in the glaire, you don't want to get excess glaire on the walls of the impression, and you want to get no glaire at all where there will be no gold. You will apply two layers of glaire, allowing the first layer to dry before the second.

The contact of the nib with the leather is what lets the glaire flow, and you do not need much pressure to make this happen. Do not work too fast. Using excessive pressure will cause leather particles to work their way into the nib and clog it. When applying your second coat, use a *very* light touch so that the glaire from the previous coat doesn't clog the nib.

Alternatively, you can paint the glaire into the impressions with a very fine watercolor brush.

**Tooling with gold:** There are multiple ways to transfer the gold to the leather. The one we are employing here is to pick the gold up on the face of the tool, push the gold onto the side of the tool to clear the sighting, tool in a “glaired-in” line, fold the gold over and tool it until the excess gold is either in the impression or will be wiped away.

- (1) Take a leaf of gold out of the booklet and lay it on the cushion.
- (2) Cut it into 1/8" strips that are just slightly longer than the tool itself.
- (3) Heat the tool up.
- (4) Cool it down to just on the sizzle.
- (5) Clean the face of the tool on the clean suede pad (\*use the pad with honing compound if there are any stubborn deposits on the face, then clean on the plain suede pad).
- (6) Rub your pallet on the Vaseline'd suede.
- (7) Pick up two layers of gold onto the face of the tool.
- (8) Lightly push the hanging gold on the sighting side onto the side of the tool with your cotton pad.
- (9) Very carefully line up your finishing tool with your tooled line, and once you feel the tool in the impression...
- (10) Grasp the tool tightly and with a short, sharp, and (most importantly) confident grip, tool the line.
- (11) Fold the gold back on to itself to the right, so your sighting is still unimpaired and tool again.
- (12) Fold any remaining leaf back onto itself and tool again.
- (13) Clean away any excess leaf with fine cheese cloth wrapped around your finger.
- (14) Continue tooling the line in this way until the line is complete, with no breaks in the gold, taking care to not dig the tool in where the line ends.
- (15) After your line has been completely tooled and excess gold wiped away, further clean the line if necessary with the orange stick, wetting the tip of the orange stick with a bit of saliva and, with a slight back and forth movement, gently remove any unwanted gold.
- (16) If your impression needs it, you can burnish the gold to increase reflectivity by taking a warmed tool, well below the activation point of the gilding size, and going back into each impression with a good amount of pressure, rocking the tool subtly in all directions.

**\*Deliberate precaution:** This is a particular issue that will undoubtedly occur in your work. There comes a point where what you are tooling is already very good, and that one more pass with gold will make it great. At this you must also consider: "I can make it great with one more pass, *but* I also run the risk of messing up, creating a double impression or, effectively ruining all of my previous work". This is *not* to say you should settle for a lesser quality of work, or frighten you into thinking about settling for it, but rather to have you consider the project, consider your skill level, and weigh the risks to arrive at a conclusion. The ideal approach is to practice until you are proficient, and to not attempt to work on a design which your skill set isn't ready for.

**For mistakes:** The earlier you catch the mistake the better, but try not to make them by focusing on each movement you take... sometimes being "in a groove" can open you up to doubling up or going outside your impression.

**Small errors:** Before *each stage* in blind tooling, examine your tooling to see if the line is straight, or if there are any mistakes. If there are, **don't panic!** Instead, relax. Take a very fine needle and pick out the impression, add some moisture to the area with a cotton ball, and wait until that area is dry before working on it again.

**Off-center impressions:** When an impression is off center or not as aligned as it should be, one possible way to fix it is to wet the leather, and, using a cool tool, go back into the impression and twist the tool until the impression is correctly aligned.

**Burning the leather:** The building up of the impression in blind tooling is structured to avoid burning the leather, since this is the only time moisture is present while you are tooling. If the surface around the tooling becomes burnt, you will likely have to change your design accordingly to hide this—a "design

opportunity”. If just the bottom of the impression is burned, and the depth of impression is what it needs to be, you may still be able to gild it, but you may need more layers of gold or more glaire to make the impression work.

**Double impression:** This kind of mistake really makes the heart drop. Like above, you must first relax, wait for the leather to dry if needed and then pick out the double impression. If the leather retains enough heat after the pressure, adding water has the possibility of darkening the leather, so you will want to wait a minute or two before adding moisture. If the leather is discolored by the tool, a design opportunity may have to be made.

**Stubborn gold:** If the orange stick & saliva is not cleaning off unwanted gold, and if a dull divider & saliva is not working, it is possible to prick out the gold very carefully with a sharp needle. Again, this needs to be done very carefully so you do not mar the surface of the leather.

**Breaks or weak reflection** are generally caused by a few possibilities

- the tool is not hot enough to activate the size
  - retool with gold and a hotter tool
- not enough layers of gold are causing the leather to be visible
  - retool the impression with gold
- or insufficient application of glaire
  - apply another coat of glaire, wait for it to dry, and retool with gold

**As always,** practice is the best way to avoid mistakes.

### Moving Forward – Decorative tools

The main difference between line-work and using decorative tools is in making the impression itself. Decorative tools are generally engraved on a domed surface (please make sure of this if you are purchasing tools), so when you make your impression, you want to first focus your pressure straight down on the tool, and then rock it front to back and left to right. This allows you to get even pressure on all parts of the impression.

Blind-tooling with decorative tools is the same as previously described—starting with a heated tool through your template, then with a hot tool and dry leather, then moist leather and a cool tool, and finally with moistened leather and a warm/hot tool.

The gilding process is the same: build up your blind impression, apply two coats of glaire, pick the gold up on the tool, clear your sighting, and tool your impression with gold. In picking up the gold, you can use a lightly vaselined cotton ball on the face of the tool and where you sight from, where the gold can be pushed up against the tool to give you a clear line of sight. If the details of the tool are too fine for the Rapidograph pen to work without getting excess glaire around the impression, use a fine watercolor brush. Alternatively, you can glaire-in the whole area of the tool—if the tool has fine detail, make sure to tool with a slightly cooler tool than usual so the details retain definition. Before each impression, make sure to polish the face of the tool on your suede pad, only using the honing compound when absolutely necessary, and blow any leather bits out of the tool before making your impression. Some people use a toothbrush, shoe brush, or other brass-safe brush for this—do this quickly so that the tool doesn’t lose much heat before tooling.

Tooling with handle letters is the same as with decorative tools.



\*When tooling dots on a book, you want to work with the book's head nearest you and the tail pointing away. This is based on the inevitability of tooling not quite at 90°, so that when the book is being handled, with the head up as it normally is, the reflection dances more readily.

## Further reading and sources:

-*A Craftsman's Guide: An Introduction to Gold Finishing* by John Mitchell. The Standing Press, Worthing, Sussex, United Kingdom, originally published in 1995, revised and reprinted in 2005.

-*Finishing in Hand Bookbinding* by Herbert and Peter Fahey. Published by Herbert and Peter Fahey, San Francisco, CA, 1951.

Republished by Alan Isaac Rare Books, 2014.

-*Notes on Don Glaister's Guild of Book Workers 17<sup>th</sup> Standards of Excellence Presentation on Gold Tooling in Ann Arbor, Michigan, 1997*. Guild of Book Workers Journal Volume 35 A.

-*New Directions in Bookbinding* by Philip Smith. Van Nostrand Reinhold Company, New York, NY, 1974. Pages 104-108. Includes *Gold Tooling* by Emilio Brugalla, pages 106-107.

In French:

-*La Dorure et la Decoration des Reliures* by Jules Fache. Chez L'Auteur. Paris, 1954.

-*Dorure et Decoration des Reliures* by Yves Devaux. Les Editions des Galions, 2000.

These are but a few of the many books and articles on finishing.

Videos: Don Glaister's multiple Guild of Bookworkers Standards presentations on gold tooling

Stuart Brockman's Guild of Bookworkers Standards presentation on gold tooling

Michael Wilcox's Bookbinding 2000 presentation

## Supplies:

**Revengea Grabados:** in Madrid [www.fersadorer.com](http://www.fersadorer.com)

**Alivon,** in France: [www.jb-alivon.com/langues/anglais.htm](http://www.jb-alivon.com/langues/anglais.htm)

**Brien Beidler,** bookbinder and tool maker, finishing tools and other hand-tools such as paddle-dividers

**Bookbindesigns:** <http://bookbindesigns.co.uk/>

**Ebay** often has second hand finishing tools

\*A quick note here, unless you are planning to use the tool only on the spine of a book, do not buy decorative tools that have a flat face (except dots or very small shapes)

**Thermolyne** student hotplates can be ordered new from places like Fisher Scientific, or second-hand.

**Wehrung & Billmeier Gold Leaf:** [www.wbgoldleaf.com](http://www.wbgoldleaf.com)