

Period Raised Gilding with Gesso

HL Penelope de Bourbon

512-297-8182 | blog.craftedcalligraphy.com

Why Gesso?

There are many mediums that we can lay gold on, but for the bold, pillowy raised gilding of the Middle Ages, there is no substitute for gesso. Gilding gesso is **NOT** the same thing as the gesso used to prepare canvas or board for painting. Both types mix chalk/plaster with a binder, but gilding gesso is thicker and has additional ingredients to help the gold stick, while prepared gesso is mostly white acrylic paint. Because gesso is made mostly of plaster, it dries **HARD** and keeps its shape without caving in on itself. The finish of the gold mimics what it's laid on exactly – gesso can be polished to glassy smoothness for brilliant gilding or tooled so that the gilding has dimensional patterns. One of the greatest things about gesso is that its tackiness can be adjusted in the recipe so that it works for the climate and humidity level of the place you live by adding another drop of honey or a touch more hide glue for dry places, or adding a bit more slaked plaster in humid places.

Materials

- Patent gold leaf – the thicker variety is better, I order from lagoldleafus.com and get 23k double gold leaf for about \$50 per book of 25 sheets
- Sharp, small scissors – I use embroidery scissors or an exacto knife or scalpel
- Soft mid-size to large bristle brush to sweep away excess gold (I have a dedicated brush that's sable or squirrel – this is an ideal use for the damaged fancy-ish brushes on clearance at the art supply store)
- Brush or quill to lay the gesso on the page
- Tweezers or deft hands
- Burnisher – polished agate (optional: hematite or a cotton ball)
- Glassine
- Gesso – recipe at the end of the handout, or you can purchase gesso buttons from John Neal for \$14 apiece

Optional, but very helpful supplies:

- Extra liquid hide glue
- A wide straw or index card rolled into a tube and taped shut
- Sewing pin for popping bubbles in the gesso
- Sharp set of picks to tool designs into the dried gesso
- A very clean flat or angled brush (ideal) or a very clean round brush

Instructions

Gilding is the first thing that happens in the painting and illumination process. Most do it before calligraphy so that the page is as pristine and free of skin oils as possible. Real gold will stick to just about anything – including gouache and some inks – so gilding **HAS** to happen first. I usually trace and ink the layout for my whole piece, using a pencil, then gall ink and a crow quill nib or pointed pen nib.

Then, I prep the areas to be gilded (step 2 below) if I'm not working on vellum (because I'd prep the whole page before starting, but paper or perg doesn't need that treatment), then touch up the inking if I needed to in the gilding areas. I do calligraphy first, because if I'm going to make a big mistake, it will be here, then gilding, then the painting, and finally the detail and outline. If you are only doing the illumination and painting, simply skip the calligraphy part. I add a note on the back telling people that this has been gilded with real gesso and gold leaf, so DO NOT BEND it, do not touch the shiny, and I carefully tape a piece of tracing paper to the back and fold it over to cover the front for storage, transport, and handling.

Gilding isn't exactly hard, nor is it easy. Complex, angled shapes and fine details are better left to shell gold or gold gouache. This is a period practice – you'll often see raised gilding on a big initial, then flat gilding or some sort in the details, dots, borders, and ivy leaves. You want big, organic shapes to start with when learning raised gilding, so design accordingly.

1. Reconstitute your dried gesso tab with a little glair or warm water in a tiny dish. I start with about a teaspoon of liquid. Cennini prefers glair for this, citing its superior binding in low humidity. Sometimes, I start with half the amount in very warm water, give it a few minutes, then add half glair, so as to speed up the reconstitution process. If the reconstituted mixture is too thin, you can let it evaporate a little. Be very careful when you stir to do so slowly and in one direction so that you incorporate as little air as possible. Tiny bubbles make a bunch of tiny pockmarks on the final surface, and fixing them is irksome and fiddly. Reconstitution can take a while (2+ hours), and there's no harm leaving it to hang out, since you can always add a few more drops of glair or water to get your desired consistency.

NOTE: once the glair-based gesso has dried, it is **REALLY** hard to reconstitute a second time – plan to lay all the gesso in one sitting if going this route

2. While the gesso is reconstituting in its tiny bath, prepare your gilding surface.
 - a. Gesso needs something with a little tooth to grab onto, or else it will pop off of your page. Perg prepped with a white eraser, same as you would to paint, has been sufficient. I sometimes gently scrape the surface with a rounded blade. You can raise the fibers of a smoother paper or vellum using very fine pumice powder and/or gum sandarac powder rubbed in with the finger tips and carefully dusted off.
 - b. If you need to touch up the ink on the area you're gilding, do that now.
 - c. Optional: paint a thin, even coat of liquid hide glue over the area you're going to lay gesso. Wash your brush *very* well immediately after you're done. Hide glue has some flexibility, and it will help keep the gesso from breaking as the piece is handled and can minimize buckling from the moisture in the gesso.
3. **WASH YOUR HANDS REALLY, REALLY WELL.** The oils from your hands will transfer to the page, and gold will stick to your fingerprints. I wash my hands between each step and sometimes slap a big post-it note to the underside of my writing hand. Nitrile or clean cotton gloves work, too.
4. Gesso consistency is a matter of personal preference. For raised work, you want something the consistency of pancake batter. If you want it to be flatter, add water by the drop until the

consistency reaches what you want. For totally flat gilding and tiny details, gesso is an unnecessarily fussy choice. Hide glue thinned with a tiny bit of hot water and garlic juice are both excellent, easy period sizes for flat gilding.

5. Start by putting a puddle of gesso in the middle of your gilding area and draw it to the edges to fill in. The goal is to have the bulk of the gesso in the middle so that it has a nice dome that slopes down to the edges. When I need to add more gesso, I add it to the middle and work to even out the distribution. This will mostly happen naturally because it's a viscous liquid. Before declaring yourself finished with the step, check out your gesso from different angles to check for a smooth, even surface. You want it to look like a lovely, silken pillow without lumps or dips. Wash your brush *really, really well*. If there are tiny bubbles, pop them with a pin and smooth the area over. There is talk of monks using a finger with earwax on it to do this, but just use a pin. Earwax will not improve your gilding surface...
6. **Let it dry ALL THE WAY through on a flat surface.** Depending on the thickness, this will take from several hours to overnight. Assume that it needs to dry overnight. If you start burnishing the surface, and it's still liquid in the middle, the gesso will crack and cave in, and you will have to start all the way over. Gesso works to create the beautiful raised surface with the magic of surface tension, so if you don't let it dry on a flat surface, your gesso will pool downhill and look weird, and you'll be sad, and nobody wants sad scribes.
7. Refine the surface of the gesso. The gilding is only as good as the ground surface it's laid on. This is a really important step. Without this step, the gold will stick and be shiny, but you can't get that mirror finish that you see in period examples. If something is really off, you can carefully scrape it with a scalpel or exacto knife with a rounded blade, then follow the steps below.
 - a. You are going to burnish the surface of the gesso until it's shiny and lovely. WASH YOUR HANDS FIRST. This is what agate burnishers are for – they are *not* for burnishing the gold itself. You can use a rounded and polished agate stone from a rock shop or one of those glass pebble things you can get in a bag at a craft store, too. If those are not available tools, you can also get super fine grit sandpaper at the auto shop and carefully sand down your gesso. This is grinding down minor surface imperfections and irregularities from the plaster. Be very gentle at first and work towards being somewhat firmer. You will never vigorously burnish or push hard. What we want to avoid is cracking the gesso, creating new surface irregularities with our fervor, or damaging its bond with the page.
 - b. Be sure to brush the surface clean often with a big, soft brush (not the one you use for sweeping off gold) so that stray bits of gesso don't scratch up the surface you just polished. The scratches will show in the gold, even if you can't see them readily on the gesso.
 - c. You can also tool designs into the gesso with picks. Brush away excess gesso dust often while tooling. You won't be able to get into the fine designs to burnish them. Gilding can't be perfect, and there will be minor imperfections in your tooling. It's supposed to be that way, and that's ok.

8. THE TIME FOR GOLD HAS COME! You know what that means? Time to wash your hands again and turn off the ceiling fan and keep the pets and small children away from your working space. Use patent gold, which is gently stuck to a backing paper. Loose gold works beautifully, but I'm not covering that (and you need a lot more tools). Using small, sharp scissors, cut a piece of gold the size of your gilding area (or veeeeery slightly larger). Have your tweezers and breathing straw/tube at hand. If you are gilding a large area, be prepared to work in stages. It can't be done all at once.
 - a. With deep, moist belly breaths, breathe onto the surface of the gesso with your mouth. The moisture will activate the surface layer of glue and honey and give the gold something to stick to. You can see it change from a satiny look to more shiny. If you're having trouble, having a hot beverage helps, as can using a wide straw or tube to help focus the breath over an area. Or pretend you're Aslan in Narnia, breathing life into statues. Or a dragon. That's the kind of deep belly breath you need.
 - b. When your gilding area has been evenly moistened, quickly grab your gold piece with the tweezers and lay it gold side down and paper side up on the thing you're gilding, making sure everything is covered.
 - c. Set down the tweezers and gently, tenderly lay the piece of glassine over the paper of your gold leaf. Secure it with the finger(s) of one hand while using it to gently press the gold into the surface of your gesso. Gently smooth the gold down with your fingertips – do not use your fingernails as burnishing tools. Gently lift the glassine and the paper backing off. If you're working a large area, repeat this step until all of your gesso has been covered.
 - d. TROUBLESHOOTING: Nothing but gold should be stuck to the letter. If the paper stuck, you got it too wet. Carefully peel away, let it dry for a few minutes, then breathe on the gold and lay another layer over the first one. Gold sticks to everything, including itself. If the gold didn't stick well or stuck in patches, the gesso wasn't wet enough. Make a cup of tea or cocoa and have another go. Gold is finicky but oddly forgiving.
9. There will be a little bit of extra gold around the edges of your design. I think of them as the selvedge edges of the gold. Breathe on your gold again to provide a bit of moisture. Using your very clean angle/flat/round brush, fold these edges very gently back flat against the body of your design. The gold will stick to itself. It creates a beautiful, crisp finish at the edge, just like when you take the time to press your seams open while sewing. Lay the glassine back over your design and gently rub these folded up edges into the gold with your fingertip.
10. If you want to lay a second layer of gold, now is the time. You want to do a second layer, or even a third. Medieval gold was thicker than our machine pounded gold. The gold itself is about \$2/sheet, and you've done a lot of work to add the gilding. Adding additional layers usually works out to \$0.50 or less to cover the whole design and makes an enormous difference. Take your piece out in the full sun with just one layer on and note imperfections in coverage. Add some more gold and go look again. All you have to do is breathe on your design like it's the gesso and repeat the steps above.

11. Using your big, super soft and incredibly clean brush, carefully brush away the excess bits of gold. I have a dedicated brush and carefully wash it in a dedicated covered jar of distilled water. The gold sinks to the bottom. You can eventually turn it into shell gold or save it for some other use.
12. The final step is to work on the gold directly. Scribes disagree on how necessary this step is, and skipping it is ok. You should probably go wash your hands again. This is to add a final bit of cohesion and shine to the gold. When working directly on gold, do not use your agate burnisher and work with extraordinary gentleness. You should have 2-3 layers of gold down.

If you have a real hematite burnisher, use that. The lipstick shaped one is ideal, and plan to spend \$100+ on one. If you have one, lay your piece on a cool surface, like a tile that you have placed in the freezer for a few minutes. Gently burnish directly on the gold. The cold + the gentle friction from your hematite burnishing aids in adhesion of the layers to each other and the gold to the gesso base. If you are not using hematite, the cold surface step is not necessary.

If you do not have an expensive hematite burnisher, fear not! Use a fresh, high quality cotton ball to gently, gently burnish the surface of the gold. You can gently rub a q-tip (between very clean fingers) in the direction opposite to which it has been spun to make a fluffy burnishing tool for details. Cotton makeup remover pads are pressed and have some patterning that can scratch the surface. In my opinion, the hematite burnisher is nice, but not necessary. If you see one for less than the price above, it's probably not real hematite. You could also buy a polished hematite stone of an appropriate shape through a reputable rock shop or geology shop. The lipstick shape is the most convenient for the shapes and angles of most raised gilding.

13. If there are any uneven edges or raggedy bits, you can carefully scrape those away with a #10 blade scalpel or rounded blade exacto knife. You can lay the glassine over your letter if you need to protect it from your hand oils. If the paper is a bit scratched from this, you can super duper carefully burnish the page smooth with your agate up to the edge of the design so that you can paint your little outline and not have it feather.

As you can see, this process takes a couple of days from start to finish. It's not hard to do, but it can't be rushed. You *can* break it up into chunks, just like doing laundry loads while you do other stuff around the house. The only thing that shouldn't be broken up for longer than the space of taking a break or eating some lunch is the part where you've started breathing on the gesso and laying the gold. Humidity is the most variable factor in this process, and you want to be as constant as you can be while working, lest half of a letter be slightly darker because you got the gesso wetter in that part when you were working because there was residual moisture from when you breathed on it and activated it an hour ago.

Special note for working with silver leaf:

Silver wasn't used as often as gold, one presumes because it tarnishes. That said, it IS in manuscripts. Sometimes shiny, sometimes black with age and oxidation. It's not **quite** as magically sticky as gold, so you may need to add ONE extra drop of honey or hide glue in your gesso reconstitution if it's not sticking. The secret to keeping silver leaf from tarnishing is to paint over it with a thin and even coat of glair. Maybe two.

Recipes

Glair

Glair is made by whipping egg whites into a stiff meringue, then leaving them overnight at room temperature. A yellowish, clear liquid will “weep” out (sometimes, it’s called egg weep), leaving a scum on top. Peel/spoon away all the scum. Store the glair in a sealed glass container in your fridge indefinitely. It’s useful in making your own gouache. It’s a great binder for reconstituting gesso. And based on my experiments, farm eggs or the high-end grocery eggs make a significantly better glair than the cheap grocery store eggs. It’s much less brittle, just as the egg whites in these eggs are viscous and stretchy instead of watery. Since glair is a binder and sealant, it’s important for the quality of the final product that this component actually be good at binding and not brittle. One egg will make PLENTY of glair for your projects and last a good long while.

Slaked Plaster

Slaking is a process where you neutralize the pH level in plaster. Chalk, plaster, lime, and calcium carbonate are all basically the same thing, and they are somewhat acidic. Acid + art = bad. You can buy chalk powder from many sources, plaster of Paris at the art store, and garden lime or calcium carbonate in the garden section of the store. Because gilding is fine work, we want the finest powder possible. Powder graded for art applications is probably much finer than that for gardening, and it will be priced accordingly. You can grind it more finely in a mortar and pestle.

Slaking is the process of repeatedly “washing” the plaster by stirring it up in purified water, letting the plaster settle, pouring the water off, and repeating the process. This is washing away residual acids. You need to test the pH level of the water you’re pouring off. You can use pH strips or you can put some of the water in a cup, put in some baking soda, and observe what happens. If it’s still acid, the water will gently fizz or sparkle. If it does nothing, even when you stir it a bit, the plaster has been neutralized. Science! When the water tests as neutral, drain off the water and dump the plaster sludge into a finely woven piece of cloth, like muslin. Let it drain well, flatten it out into a big cake, and dry. Break and grind up the cake of plaster as needed to make gesso. NaturalPigments.com [sells slaked lime for about \\$15/kg, if you don’t want to do it by hand.](http://NaturalPigments.com) A kilo of plaster is a lifetime supply.

Gesso – The Lead-Free Version – from Mistress Yvianne de Castel d’Avignon

- 1 Tablespoon of slaked plaster (pH neutral Plaster of Paris, chalk powder, or calcium carbonate)
- 1 Teaspoon of liquid hide glue or reconstituted hide glue or rabbit skin glue or reconstituted technical gelatin or fish glue (fish glue is not preferred because it’s more brittle and acidic, but it will work). Warming this by putting the bottle in a bowl of hot water makes it thinner and easier to work with.
- 6-12 drops of warm honey
- A coloring agent, such as red bole powder, yellow ochre, or a teeny bit of yellow ochre or red gouache. Use less than you think is necessary, especially with dry pigments. You want the end product to be reddish or golden, to enhance the color of the gold and help mask any teeny tiny spots where the gold didn’t adhere properly.

Put the slaked plaster in a bowl with dried pigment if you’re using it to color, blend the wet ingredients, and gently stir them into the plaster. The final consistency should be like pancake batter. If it’s not, you

can adjust your recipe with a little bit of distilled water, added drop by drop. This recipe can safely and easily be scaled up to make a batch for friends to share.

Test out your gesso with a small patch and tightly seal your batch while you wait for it to dry. See if it needs to be adjusted. It may need adjustment because it's a rainy day or because the winter heat blasting has made the air dry. Fussing with the gesso is a part of the process.

Is your gold not sticking well or sticking in a patchy way? Start by trying to activate it with your breath with a hot beverage first. If that's not working, then try adding 1-2 drops of warm honey. Test again.

I put the gold over my gesso, and some of it came through the gold and stuck on the paper! You live in a climate that's more humid than the gesso recipe anticipated. You can try again on a dry day. You can add a bit more slaked plaster and experiment with that and honey to find a good balance when you test to see how the gold behaves.

Humidity is a MAJOR factor in how gesso behaves, so the gesso I make in Savannah will need to be adjusted for a friend in Denver or Atlanta. More honey adds flexibility and stickiness, but too much will be too sticky and dull the gold. More plaster makes the gesso less sticky (good to know for those in humid climates!) AND it's what you add if your gesso dries with a divot or fallen middle. If you add more hide glue it will do three things: first, it will make it stickier, second, it will make the gesso harder, and third, because it's kind of gelatinous, it smooths any grainy quality from the plaster and can make a nicer surface for the mirror-like gilding. Whatever you're adding, do it in teeeeeeeny tiny increments and let a test dot dry (a blow-dryer helps). Breathe on it and see how gold sticks to your test dot. Adjust as necessary.

SUPER DUPER CHEATING TRICK FOR FAKE LEAF – If you want the benefits of gesso for gilding but cannot afford or do not want to use real gold leaf, the gesso can be modified when reconstituted. Add a few drops (3-5? In ~1 button of gesso) of the Mona Lisa brand Metal Leaf Adhesive (Speedball makes it) that you get at the craft store before you lay the gesso, then follow all steps as usual. Its rubbery nature may present a slight challenge when it comes to burnishing the gesso. You don't have to work it quite as much as you do for real gold because it won't behave quite as magically. You can also paint the adhesive over the gesso after you refine the surface, let it dry, and put down your fake gold.

Note: you can't lay multiple layers of imitation leaf, because it will not stick to itself, nor should the leaf be burnished directly with anything but a cotton ball. Imitation leaf doesn't break away from itself as cleanly as real gold does, so plan to cut away excess very carefully and gently with an exacto knife or scalpel before brushing it away. If you just brush, it has an awful tendency to peel away some of what you stuck onto your design.

Bibliography and Resources

For gold leaf: LA Gold online has the best prices and fastest shipping I've found. John Neal and several other calligraphy suppliers also carry excellent quality gold leaf. Unless you learn how to handle loose leaf and get all the supplies for it, you'll want to stick to patent or transfer gold.

For pigments and slaked plaster and hide glue or gelatin, naturalpigments.com is THE source. They also sell oil-based gilding supplies and ingredients. These are NOT for use in scribal things because the oil

seeps out and stains the page. They're for oil painting and wood applications. If you're going to start making your own paints and scribal materials the period way, prepare to send this company your money. Their product listings have extensive educational information about what they are, what you can do with them, how they're made, and how and why they're different from similar products. It's a good place to pool purchases because it tends to be rather a lot for a single batch of something.

John Neal sells gesso, flat gilding options like gum ammoniac (so smelly), animal glues, burnishers, glassine, gold, and synthetic gilding sizes (Instacoll is my favorite, but you can't make it very raised)

Cennini, Cennino – "Il Libro Dell' Arte", published by Dover Books.

- He has period recipes for gesso sottile, which contain white lead as a flexible binder. While I am comfortable working with poisonous materials, I do not presume that anyone else is, or that they want them in their homes, around their children and pets. I use the modified version with honey from Mistress Yvianne de Castel d'Avignon, which has been floating around the SCA for a while.

d'Avignon, Mistress Yvianne de Castel – "Making a period style gesso for use in raised gilding",
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Thompson, Daniel V. – "The Materials and Techniques of Medieval Painting", published by Dover.