

# LESSONS FOR Lovers of Luster

BY FRANCIS S. LESTINGI, PH.D.



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**W**HEN A KINDHEARTED and seasoned sign artist agreed to instruct an elementary school kid in the intricacies of the art of gold leafing back in the last millennium, he not only shared his considerable expertise but unwittingly conveyed a deep sense of passion and an abiding gusto for gilding. Today, we don't know who that generous gilder was, but I was that eager kid. Since then, I have pursued many varied endeavors, and for the last 18 years I have been running a successful sign business devoted exclusively to hand-carved, gilded wood signage.



Gilded signage, though a very small portion of the industry, is considered one of the highest forms of sign artistry because it uses the venerable and precious metal, gold. Besides its stunning ability to interact with light, gold has the remarkable property of being highly malleable, which simply means it can be made to be incredibly thin. This one fact is of utmost importance because it determines how it is applied to surfaces, which always has been and probably always will be accomplished entirely by hand.

Gold is so soft and malleable that one ounce (currently worth more than \$1,600) can be hammered into a banner 3-ft high by 33-ft long. **(Photo 1)**

A 1" cube of gold (worth more than \$18,000) could make a 3'-high banner that would be longer than a football field (376 feet).

Because the thickness of a typical sheet of gold leaf is 1/1,000 of the thickness of an ordinary sheet of paper, it would take 1,000 sheets of gold to match the thickness of one piece of paper. And since a stack of 250 sheets of printer paper is one inch, we would need 250,000 sheets of gold leaf to stack up one inch. Thus, one sheet of gold leaf is one-quarter of a millionth of an inch thick.



**Photo 1:** One ounce of U.S. gold currency coin worth about \$1,680. The "gold" 1" cube is actually gilded Plexiglas. If pure gold, it would weigh 11.3-oz. And be worth more than \$18,000.



**Photo 2:** Extremely fine and pure Kaolin, USP powder is sprinkled on appliqué, spread and smoothed out and then vacuumed.

#### SIZE

Covering a surface with "solidified sunshine," which gold leaf is sometimes called, is known as gilding. A variety of surfaces have been gilded since the practice started some 6,000 years ago.

Adhering gold to metal, wood, stone, leather, glass and other surfaces has led to an array of "adhesive" techniques. The adherent is called "size" and today there are basically two types: water and oil.

Water sizing can be divided into two categories: that used for glass gilding and that for gilding items such as furniture, statuary, and picture frames. Glass gilding, which was once very popular for signage for banks, barbershops, and bars, uses a gelatin-water size. The other water based size technique uses a rabbit-skin glue and an extensive surface preparation that includes the application of gesso (plaster), bole (clay), and a gilding liquor (water, alcohol, and rabbit skin glue). After the application of gold leaf, cotton balls are used to tamp down the gold into the bole, and then an agate stone tool is used to burnish, rub and polish the gold to a high reflective luster.

Oil sizing, which is relatively new compared to the afore mentioned water gilding, came into vogue at the beginning of the Renaissance. For exterior signage today, oil size is a necessity because of its durability and its ease of use. Two speeds of oil size are available: slow and fast. We always use slow size, allowing it to cure

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Photo 3: When untinted clear size is applied with lettering quill over kaolin-dusted surface, size is readily discernible.

*The price of one ounce of gold in 2001 was about \$250. In the summer of 2011, an ounce of gold was worth more than \$1,900.*



Photo 5: Before sizing, the overlap paint is sanded down with 80-grit sand paper to insure a clean, crisp edge on carved text.

for at least 24 hours. Depending on conditions such as humidity and time, we even let the size cure for 48 hours. The higher the humidity, the slower the cure time. We avoid using fast size with its one or three hour cure times for quality reasons.

Since oil size is colorless, for years gilders have been tinting (contaminating) it with enamel paint or other additives to help improve its visibility during application. I was guilty of this adulteration technique until I realized that I was altering the size's physical properties such as curing time and bonding. Instead of inserting an altering additive into the size, I decided to add a benign substance to the surface to be gilded, dusting it with Kaolin, USP. (Photo 2). The powder is first sprinkled over the surface and then spread smooth with an artist's mop brush. When a uniform film of kaolin is achieved, the entire surface is vacuumed to remove any excess powder. The remaining film residue of kaolin makes a dark surface appear grey, and when un-tinted size is drawn through the kaolin, the size will be rendered quite visible. (Photo 3) It will appear that you are painting with dark, high-gloss enamel.

And, very importantly, the amount of contamination of the oil size, *vis-a-vis* an additive, will be infinitesimal since the kaolin particles are as small as 0.2 thousandths of millimeter. Talcum powder should not be used for the pre-sizing preparation because its particle sizes are generally far larger by 1,500-times, and talc often contains perfumes and oils that will contaminate the size. As an added bonus to using kaolin, "shiners" will be prevented. Gold adhering to a surface where it should not is no longer a problem because a kaolin dusted surface will prevent gold from sticking to it. To remove kaolin from surfaces after gilding is complete, simply wipe it away with a soft shop paper towel moistened with water or RapidPrep.

After hand carving a panel through a pattern and removable vinyl paint mask, the carved text and other elements must be primed and top-coated as the substrate was prior to the application of the mask.

Regardless of the substrate color, we always paint the letters, numbers, and any other carving black so the kaolin dusting will turn the black to grey when applied. The text painting can be done quickly and with impunity over the edges because of the vinyl mask. (Photo 4) However, the overlap must be removed before dusting with kaolin to facilitate the removal of the vinyl later. We hand sand the overlap with an aggressive grit (80-100), being careful not to scratch any of the letters. (Photo 5)



Photo 4: After carving through a pattern and removable yellow vinyl mask, text is primed and top coated with black enamel bulletin paint.



Photo 6: After dusting with kaolin powder, black text appears grey.

After sanding and vacuuming, the letters are ready to be kaolin dusted. **(Photo 6)** Minimal brush skill is required to size the “templated” letters compared to the logo discussed earlier. A large white sable brush is first “paletted” on a non-porous magazine page. **(Photo 7)** A thin coat of size is essential for a brilliant gild because the gold leaf will lie on the cured size

rather than being absorbed into it. Sizing should be done from

the top to bottom and on individual letters from inside to edge. Unlike the permitted overlap while priming and top-coating the text, sizing should have as little overlap as possible because excessive overlap will result in wasting expensive gold leaf while gilding. **(Photo 8)**

We avoid giving any substrate a 2" border as such a practice consumes valuable “negative space,” which is important in the overall design of the sign. Instead, we typically produce a “bead and cove” profile around the edge of the panel and we gild the cove. Kaolin dusting of the entire edge is done with a mop brush. **(Photo 9)** To increase visibility while sizing the cove with a lettering quill, we use a shop spot light. **(Photo 10)**

### PATENT GILDING

Gold leaf is available as both Patent and Loose. Patent gold leaf is actually stuck to its backing sheet because it does not have a powder called “rouge” between it and its backing sheet as loose does.

**(Photo 11)** So, theoretically, manipulating the patent sheet should be relatively easy. Granted, patent is novice-friendly but it does have many drawbacks compared to loose leaf. The weight of patent gold is always less than loose by several grams per 1,000 sheets. Its brilliance is noticeably less than loose, and most importantly exclusive use of patent will hinder achievement of professional gilding results. The only time we use patent is to gild the edge coves on our panels. We tried using a commercially available ribbon of gold, but it was very wasteful because the gold ribbon never came off the roll properly. Working with a full sheet of patent to gild the cove was equally wasteful because more gold would come off the sheet than was desired. So we decided to use a small cutting board to slice narrow strips of patent. **(Photo 12)** A paper towel, used to catch the patent strips, serves as a convenient way to transport them to the sized surface. The strips, which are slightly wider than the cove but not by much to save gold, are pressed lightly onto



Photo 9: Entire cove and bead profile edge is dusted with kaolin to make sizing discernible and to prevent gold from adhering in unwanted places.



Photo 7: Untinted clear size is paletted on non-absorbent magazine page to uniformly distribute size throughout the white sable brush hairs.



Photo 10: Cove is sized with lettering quill while shop light provides added illumination.



Photo 8: Text should be sized from top line to bottom, and letters should be sized from inside to outside with minimal overlap.



Photo 11: Patent gold leaf adheres to its backing sheet and can be manipulated by holding its edge.

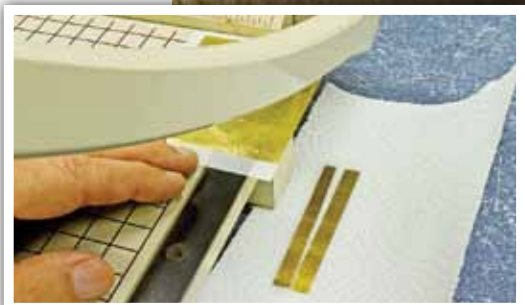


Photo 12: A cutting board is used to slice patent gold into narrow strips for gilding the cove while a paper towel catches the strips and facilitates bringing the strips to the cove.



Photo 13: Patent strips are applied to sized cove by pressing gently on the backing sheet. Cutting strip with minimal overlap preclude wasting gold.



Photo 14: Loose leaf gilding tools: (l. to r.) Large gilder's "tamping" brush, small gilder's brush, pointed gilder's brush, white sable brush, 600-grit sand paper (above brushes), ceramic honing rod, gilder's knife, booklet of 25 sheets of loose gold leaf on a gilder's pad, and gilder's tip.



Photo 15: Cutting loose leaf with gilder's knife on a gilder's pad.



Photo 16: By inserting a leather square backed by a thin metal square, the booklet is rendered rigid for cutting purposes.

the sized cove. (Photo 13) The "cleaning up" of the excess gold will be discussed later.

**LOOSE LEAF GILDING**

Professional gilders use a variety of tools to achieve the results that loose leaf can furnish. (Photo 14)

Loose is heavier than patent, produces a more brilliant gild, and can be much more manageable than patent in difficult gilding situations. Each

3 3/8" square sheet in its booklet of 25 sheets is "floating" on rouge

powder to prevent it from adhering to the backing sheet.

Very rarely will a full sheet be used, so each

sheet must be custom cut with a Gilder's

Knife. Some gilders transfer sheets to a

Gilder's Pad for cutting. (Photo 15) We

prefer to insert a square piece of leather

at the back of the book so cutting can

be accomplished while holding the book.

(Photo 16) The leather square can be

made rigid by backing it with a stiff card

or piece of light metal. Working from the

last sheet forward while holding the rest

of the book with the left thumb, the right

hand cuts the leaf with the gilder's knife. (Photo 17)

Some gilders use a long fingernail or a similar

shape crafted from an aluminum beer can to cut the leaf.

We use the gilder's knife which can be honed using a ceramic

honing rod and then cleaned with denatured alcohol to remove

any traces of oil. If, while cutting, the knife snags or tears the

leaf, we hone the blade with a piece of 600-grit sandpaper

conveniently taped to the wrist. (Photo 18)

Since gold leaf is so incredibly thin, picking it up with your

hand would cause it to "dissolve" in your fingerprints. So a

Gilder's Tip must be used to transport the leaf from the book

to the sized area. The tip is made from the finest Siberian

squirrel fur and is relatively expensive. But despite the price,

we pluck hairs out of the tip to enhance visibility through it

so that we can literally see what we are doing while applying

the gold leaf. (Photo 19)

How the gilder's tip actually picks up the gold leaf has been

part of mythological folklore for some time. Because gilder's

have been seen striking the tip across their hair, the inaccurate

conclusion drawn has been that static electricity was charging

the tip. The fact is, the gilder was charging the tip with oil. The

oil on the tip attracts the gold leaf, allowing transportation to the

size. There, the cured size attracts the gold more than does the

oil and the gild is accomplished. Gilders continue to use the

phrase "charging the tip" as a small amount of oil is placed on

the back of their hand and swipe the tip lightly and occasionally

across it to charge the tip. Preferring a more convenient

procedure that requires no extra materials, we make use of a

small amount

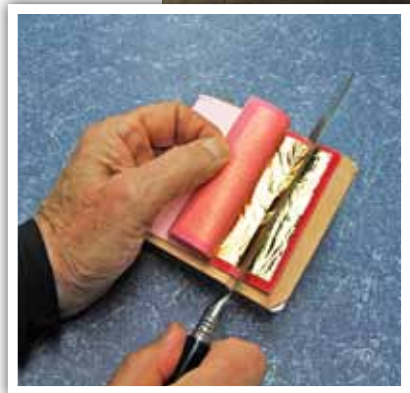


Photo 17: With booklet made rigid, sheets of gold leaf may be cut with a gilder's knife.



Photo 18: If gilder's knife snags the gold leaf, the knife can be honed on a 600-grit band conveniently taped to wrist.



Photo 19: Thinning the hairs of the gilder's tip facilitates visibility through the tip while gilding.



Photo 20: Each side of the gilder's tip may be "charged" with a small amount of facial oil by holding the tip against the cheek with one hand and pulling down with the other. (Jewelry is optional).



Photo 21: To "re-charge" the tip quickly while working, simply swipe the tip across the cheek.



Photo 22: To momentarily store the gilder's tip while cutting the gold leaf, place the tip behind the booklet.



Photo 23: Gilding is best performed from outside to avoid working over ungilded size.

of natural oil that is present on one's face. Initially, the tip is charged by drawing it across the cheek while pressing with the other hand. (Photo 20) Each side of the tip should be charged. Then, while working, to recharge the tip simply swipe it quickly across the cheek. (Photo 21)

One more thing about the gilder's tip: While cutting leaf with the gilder's knife, the tip can be stored conveniently at the back of the book of gold leaf ready for use when the cutting is complete. (Photo 22) Also, while the tip is in use, you can tuck the knife under your arm instead of placing it down.

### GILDING A LOGO APPLIQUE

When gilding a three-dimensional logo appliqué it is best to start gilding from the outside in and from bottom to top to avoid working over ungilded size. (Photo 23) Usually, there is not much difference between working from left to right versus right to left as long as you avoid hovering over cured size. (Photo 24)

The great advantage of being able to cut loose leaf into a variety of sizes becomes very evident when gilding prismatic or incised carved letters. Anticipating problems, you can cut the leaf accordingly to avoid situations such as "bridges" where a piece of gold leaf straddles a valley. (Photo 25) But if a bridge does occur, and you tamp it, the leaf will split, leaving a wide "holiday" or a spot devoid of gold.

You can try to fill the void after the split, but there is the possibility that the size lost its tack if the tamping brush touched it. A safer approach is to cut a small piece of gold leaf using the gilder's knife at a 90-degree angle to the edge of the sheet. (Photo 26) Although it is possible to cut very small pieces of leaf using this procedure, it is best to do so at the beginning of a sheet (right side) since cutting at the end (left side) can be problematic. When the small piece is applied over the bridge and tamped with the tip, the split on the bridge will occur but the void will immediately be covered by the layer of leaf that was placed on top. (Photo 27)

### BANISH (THE TERM) BURNISHING

When every area of size has been covered with gold leaf and all holidays have been eliminated, it is time to clean up. And here we return to "terminology mythology land." As mentioned earlier, in surface water gilding, as opposed to glass water gilding, there are steps like tamping the gold with cotton balls and burnishing the gold with rock hard agate tools. Somehow this water gilding nomenclature has infiltrated the oil gilding field. Using water gilding terminology in the oil gilding sphere is inaccurate and unfortunate. It can



Photo 24: There is no left or right preferred direction of gilding a line of text as long as care is taken to avoid contacting the cured size.



Photo 25: Despite efforts to avoid "bridging" (arrow), it happens at times.



Photo 26: Use horizontal cuts after vertical cuts to obtain small pieces of gold leaf.



Photo 27: A small piece of leaf applied over the "bridge" will cover the inevitable split in the gold leaf bridge.



Photo 28: "De-Skewing" (not burnishing) should be done with a very soft gilder's brush extremely gently.



Photo 29: After de-skewing, the valuable gold skewings are vacuumed with a dedicated vac.



Photo 30: Covering cured size with just the right amount of gold leaf is almost a geometry problem. It requires judgment, assessment, and anticipation in how much gold leaf to cut.



Photo 31: When gilding several lines of text, work from the bottom to the top to avoid contacting the cured ungilded size.

even lead to disastrous, or at least inferior, oil gilding results. In oil gilding, cotton ball tamping should not be done. Even the term "tamping" is too intense. An extremely soft professional Siberian squirrel-hair brush can be used to gently tap any leaf that has not already been tapped by the gilder's tip. After all necessary tapping is complete, the next step is to remove any

flecks and pieces of gold from the gild. These are called "skewings," and removing them should be done with utmost gentleness. This is *not* burnishing. There is no burnishing in oil gilding. No rubbing. No shining. All you can and should do is remove the skewings and touch the gold as little as possible.

I am even proposing *banishing* the term *burnishing* from the realm of oil gilding, and I am suggesting replacing the term with "*de-skewing*." Remove the skews and touch the gold as little as possible for a brilliant gild. You cannot improve on an oil gild. More touching, at best, will only lessen the luster and, at worst, will scratch the gold. (Photo 28)

When de-skewing the cove, be sure to save the skewings, they are gold after all. (Photo 29) We use a dedicated vacuum to gather the skewings. After each project, we empty the vacuum into a skew box. When the file box of skewings is filled, we sell the skewings to a refiner for several thousand dollars. Don't waste gold!

**GILDING INCISED LETTERS**

Gilding a carved incised letter can present "bridging" problems as mentioned earlier. To prevent such possibilities, it is best to plan ahead and anticipate situations by cutting smaller strips of leaf. (Photo 30) Also, gilding from bottom to top will prevent unintended contact with cured size.

(Photo 31) As stated before, regardless of the substrate color, we always paint the text black because this facilitates the use of kaolin and is also very helpful in locating holidays. Some gilders use yellow paint on their letters allegedly to hide holidays, but it is no substitute for gold leaf.

We want to identify any and all holidays so we can fix them. In gilding incised letters we de-skew each letter after it is gilded to prevent any loose skewings from inadvertently flying onto other ungilded letters. (Photo 32) And, of course, we pick up the skewings in the dedicated "Gold Only Vac."

When all the gold leaf has been applied, and the de-skewing has been carefully carried out, we remove the vinyl paint mask. (Photo 33) Care must be taken not to pull the vinyl into the letter. It must always be removed at a 90° angle to the letter edge.

And, of course, the final step is installing the gilded sign for all to see and admire. SDG



Photo 32: After completing the gilding of each letter, it is de-skewed to prevent skewings from spreading.

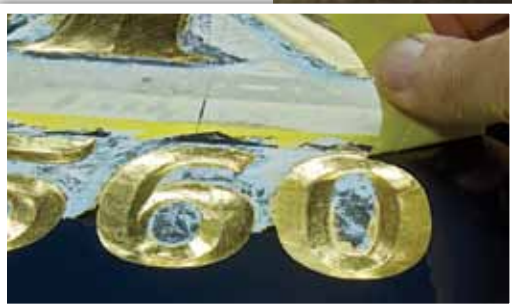


Photo 33: After all the gilding is complete, the yellow vinyl mask is carefully removed leaving clean, crisp edges on all the gold leafed text.



De-skewing (not burnishing) a prismatic letter.



Notice the depth of the hand carved letters. The root line is about one-quarter of an inch. A shallow depth carving requires less gold and reflects light more effectively than deep cut letters.