

SKILLS

- Preparing artwork
- Technical competence

TIME IT TOOK

2 hours



lo-tech etching

BY KAREN CHRISTIANS

Photocopy transfer offers an easy alternative to the classic technique

THIS EASY TO LEARN ALTERNATIVE to classic photo etching does away with elaborate setups and expensive or hazardous materials. Heat is the magic element — the toner from a photocopier melts onto the metal to create the resist.

No special equipment is needed to achieve beautiful results from a pen, a plastic bucket, and an agitator. This technique uses readily available overhead transparency film from the local stationery mega mart — and is a fraction of the cost of Press N Peel™, the more widely used material for creating metal etching masks.

Ferric chloride will etch brass, copper, and bronze. If you want to etch silver with this process, you can, but you'll need to use ferric nitrate as the mordant instead. With a few tricks of the trade, you will create reproducible results allowing you the freedom for endless variation.



applied technique



eventually burn through clothes if they are not cleaned, and it will stain, so use caution.

Cleanup

A quick trip into a bucket filled with 6 parts water and 1 part baking soda is usually enough to remove any excess acid that is left in the etched crevices of your metal. When removing the protecting adhesive on the back of the metal, do it slowly under a gentle stream of water. Too much water pressure can splash mordant back at you, so work slowly and carefully. Although you do not need to work with an exhaust system to take away fumes, make sure that you do work in a well-ventilated area.

After your etching is complete, scrub with an abrasive pad until all the toner is removed.

About the Mordants

Ferric Chloride is an iron salt. Obtained in a large gallon size, it can be used several times before exhausting the efficacy of etching. Liquid ferric chloride solution is used straight from the container and no dilution is necessary.

Ferric Nitrate crystals for etching silver are an excellent and safer alternative than nitric acid. They can be obtained from chemical companies such as Artchemicals.com. **Mix in one part crystals to three parts water, always adding crystals to water. The crystals are hydroscopic, meaning that they absorb moisture easily, meaning they will rapidly expand — do not ever add water to acid.** Storage in a tightly closed, airtight container is recommended. Spent ferric nitrate should be reused and should be decanted into a plastic bottle.

Both mordants can be disposed at your local hazardous waste center for your town. Neutralize them, and store them in clearly labeled containers for transit.

Work Safe and Smart

Ferric chloride is a relatively benign mordant, which will not burn skin or lungs like nitric acid will. However, plastic gloves and safety glasses are a good idea. Extra exhaust is not necessary, as the snap-on lid will keep any liquid in the box. This is basically a “set it and forget it” technique, because the agitation does the work.

Material Data and Safety Sheets (MSDS) are readily available on the Internet for the kind of mordant you use. Spilled ferric chloride will

MATERIALS

Metal to etch: 16 gauge to 20 gauge copper, brass, or bronze

TOOLS

ETCHING SETUP: 2 clear plastic buckets, one with a snap-on lid, inexpensive aquarium pump, clothing iron set to linen or highest setting, pancake griddle or electric frying pan set to 250° F, paper towels

ETCHING MATERIALS: Isopropyl alcohol, abrasive pad, ferric chloride, 3M™ overhead transparency film, paper towels, duct tape, double sided tape, Staedler Lumocolor #317 red pen, dense Styrofoam, scissors, baking soda, funnel, matte Krylon Spray

SAFETY: Eye protection, protective gloves

HAND: Tweezer, burnisher, flat file, 000 steel wool

SOURCES

Most of the tools and materials for this project will be available from well stocked jewelry supply vendors, many of whom can be found in our Advertiser's Index, page 71. Ferric chloride is available at electronic circuitry stores or online through zacyrl.com.

Understand Resists

Simply stated, mordants will etch metal where a “resist” is not present. The “resist” for this process is the dry toner from either a photocopier or laser printer. Ink jet printers are water soluble and will not work for this process. Many other resists can be used — from a red pen to vinyl or even nail polish. Unlike the traditional asphaltum resist, these resists are inexpensive and easy to remove. With a clothing iron and a pancake griddle, heat is applied to the metal, and because the overhead transparency film is manufactured for heat, it can take it without damage.

It is important to note that what you photocopy and transfer is the flopped image of your original art. Access to a computer can easily flop lettering in any standard photo manipulation software. However, it is not necessary to do this. Normal text can be flopped on a photocopier by making a copy of the text on film, taking that copy, reversing it on the copier and creating a second transfer sheet. We call this an “interneg.”

Artwork Prep

A high contrast, black-and-white image, such as clip art, is very good. Etching depends on open spaces and a solid resist. If your images contain a variety of grey tones, acid will eat away anything exposed and work its way down.

Help yourself get a good etch before you get to the metal, by thinking in terms of black or white. Black will resist, white will etch. If after your heat application some areas of the toner

Etched metal strip and book covers by Karen Christians.





A high-contrast image is very good. Etching depends on open space.

do not fully transfer, the red Staedler pen is excellent for tiny touchups.

Etching Action

During etching, the action of the ferric chloride eats away any exposed copper, brass, or bronze. This particle sludge can pile up on the metal surface and prevent a good etch, so it needs to be moved away from the metal during etching by either agitation or gravity.

This process inverts the metal so that the image is facing down, and it is suspended in mid-liquid by the aid of Styrofoam. The acid-resistant Styrofoam acts like a little pontoon and allows the sludge to drop down in the etching container. Agitation from the air pump strapped outside of the bucket simulates the action of professional spray etchers.

Etching with fresh mordant will take about one hour, depending how deep you wish the texture.

Check the Etch

To check the progress of an etch, ferric chloride can be rinsed off safely in a sink — with amounts of less than one tablespoon. Drain off as much of the mordant as possible in the etching container and then rinse under running water. By running your finger lightly over the etched surface, you can easily tell how much more etching you might wish to do.

How to Use Etched Metal

Etched metals can be used in hundreds of ways. Once you etch sheet, try using the metal in these ways:

- Decorative appliqué, such as sketch or scrapbook covers
- Delicate or bold textures for roll printing or embossing in a mill
- Metal clay texture plates
- Selectively pierced or as is for jewelry
- As a printing plate for paper or cloth

When fine silver, as a background or base for enameling

If your etched metal will become the finished product, you can patinate copper with an oxidizing solution and slowly remove it with a 000 steel wool to express highlights and deep tones in your metal. For brass or copper, an off-the-shelf green patina that can be painted on gives a verdigris finish. Seal the patinated final image with Matte Krylon Spray.



photocopy transfer etch

Photo 1 Prepare the metal in the following manner. First, use an abrasive pad to remove any grease and create a “tooth” for the toner to adhere to. File the metal edges to create a bevel, which will allow the iron to ride smoothly over the surface.

Photo 2 To create the container for the etching bath, you will need a plastic bucket with a secure lid. With duct tape, adhere an inexpensive aquarium pump to the outside of the bucket. When activated, the pump creates a vibration in the etching liquid to assist removal of the sludge from the metal surface.

Photo 3 Ferric chloride, gallon size. Check local electronic store suppliers and ask for circuit board etching solution. Download an MSDS form and read all precautions in using this mordant.

Photo 4 Use 3M overhead transparency film, available 100 sheets per box. The film can be used on either side. The white strip is provided for photocopiers to read the film and that an image can transfer.

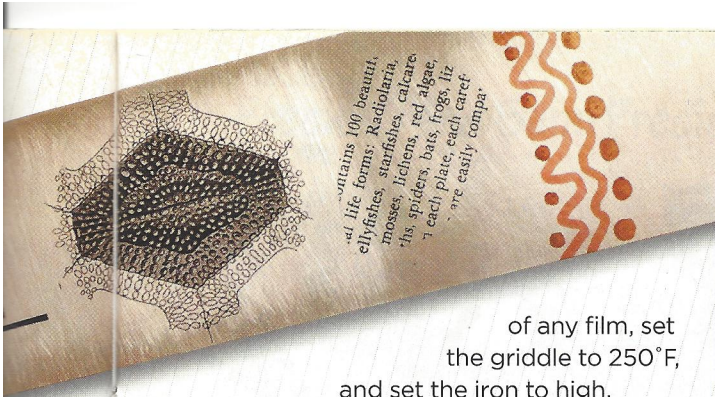
Photo 5 Once you have photocopied an image, position the transparency film over the metal to orient your image. Take care in cutting the image so no film overlaps the metal, as it will curl during the heat process.

Photo 6 Moisten a paper towel with alcohol.

Photo 7 Clean the image side or toner side of the transparency film.

Photo 8 Here comes the magic. Saturate the metal with alcohol and apply the film. This will create perfect suction between the metal and the transparency film for an airtight fit. Press on the acetate to push out any trapped air bubbles between the film and metal. When no bubbles are present and the edges are clear

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of any film, set the griddle to 250°F, and set the iron to high.

Photo 9 Place a paper towel on the griddle, then the metal, another piece of paper towel, and iron away! Keep the iron on for about one minute. Note that the heat on the griddle is dependent on the size of the surface area of your metal: more metal requires more heat.

Photo 10 While the griddle and metal are still hot, burnish the image for good contact and transfer. Keep those tweezers handy!

Photo 11 With your tweezers, start to peel back the film. Keep everything hot. You might have to go back and reburnish a bit if areas did not transfer. This step is a bit of a dance, but with practice, anyone can get this to work. Presto! Image transfer complete. Remove the metal from the griddle with the tweezers and place it on a steel block to cool. If some areas need touchup, use the red pen now. If the edges of the piece are important to the design, cover them with the marker as well.

Photo 12 Place duct tape on the reverse side of the metal to keep the mordant from etching.

Photo 13 Secure the styrofoam to the back of the piece with two strips of doublestick tape.

Photo 14 Float the prepared metal in the etching mordant. Mark the time that the etching begins. Plug in the aquarium pump and snap the lid shut. Go get a latte.

Photo 15 Check the etch after one hour to see if the bite is sufficient for your needs.

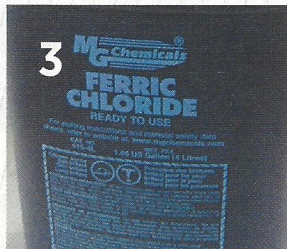
Photo 16 Remove the tape under a gentle stream of water. After rinsing, dunk into a quick bath of baking soda and water to neutralize any remaining ferric chloride.



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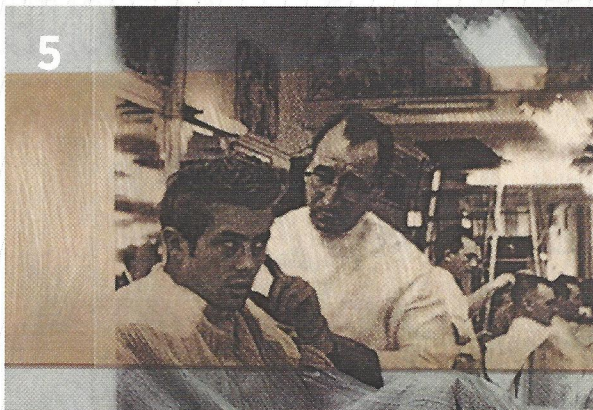
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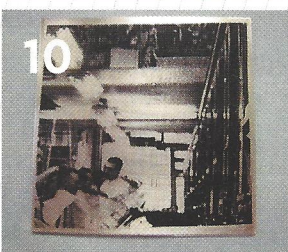
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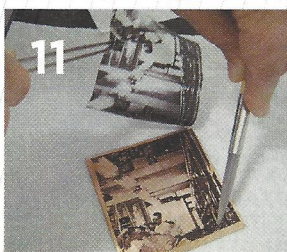
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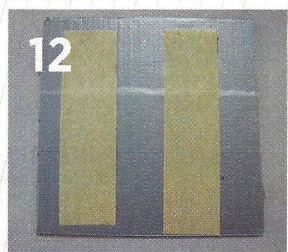
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