
Transferring your Colorfull Idea's to Jewelry

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Learn high-temperature application of ceramic transfers to kiln-fired PMC. This booklet will explain when to use this technique, which tools to use, and the application and firing process.

Helga lives and works in The Netherlands. Her jewellery education started at the Academy of Arts in Maastricht, The Netherlands. So before she came across Precious Metal Clay in 2005 she was already a traditional silversmith. Captivated by PMC because of its incredible moldable quality she immediately started to work and experiment with it on her own. In 2007 she gained the PMC diploma at the MCSJ, Cornwall, UK .

She is still astonished by this fascinating material and keeps on exploring it, creating jewellery which is sold via her website and a few galleries. She also shares her knowledge by teaching PMC workshops in the south of Holland.

Visit Helga's website - www.zilveren-akelei.nl

I started to experiment with the decals on metalclay after I saw a friend use them on her ceramics. When I first tried a decal on a fine silver piece I was astonished about the result, at that time I didn't know exactly what the possibilities were.

Through studying, trial and error I have found my way to work with decals and I will share my research with you by this presentation.

I hope more people will use transfers and share with me their result and show me the jewellery they made with this technique.

About Decals

As a precious-metalsmith you have several techniques of using color in your jewellery. Gemstones, the use of different metalcolors, emaille and resins offer many options. A ceramic transfer is another way of applying color with its own specific features. This technique is borrowed from the ceramic industry.

The ceramic decals I use on fired metalclay are water-slide decals. A water-slide decal is a type of image that must be dipped in water prior to its application. Upon contact with water, the glue is loosened and the decal can be removed or transferred from its backing. The backing or base surface is a special thicker paper. The "ink" which is used to silk-screen or print the image or pattern on the paper is made from ceramic onglazes.

Onglazes are a mixture of minerals, metallic compounds and water or oil. Enamels use the same kind of base materials as the onglazes.

They both create a glasslike surface. For a water-slide transfer this mixture of chemicals is used to create an image on paper.

After the decal is applied on a fine silver piece it is baked at $\pm 750^{\circ}\text{C}$ degree, which creates a permanent bond with the fine silver. This only works with fine silver or fine gold. It can be applied to finished metal clay, being fine silver, but not to sterling silver. This due to the oxidation of the copper. (all colors in the transfer will turn black) The colors created by this technique form a very thin permanent layer.

The words Transfer and Decal refer to the same technique.

The word decal is short for "decalcomania." The word Decalcomania is derived from the French word "decalquer," and was coined by Simon François Ravenet about 1750. The "mania" was added during the Decal craze of the late 1800s. (For history, more info on www.ceramicdecals.org a very informative site about all sorts of decals.)



7 small plate's or "showing my colors"

Ceramic onglaze transfers are basically made by two different technics. They each have their own advantages and dis-advantages.

Silk-screened Decal

This type of transfer yields beautiful colors which give a fine layer. Companies applying this transfer type know exactly what chemicals their onglazes contain because they mix their colors themselves.

The disadvantage is that when you want a custom design, it is very expensive. A minimum of 100 sheets is common practice. Company's who make this often have standard designs called stock designs and those you can order on sheet from. I use stock designs which I cut and punch in personalised designs.

Digital printed Decal

A second possibility is a decal produced with a special printer using patent-protected ceramic toners. The biggest advantage is that small runs are inexpensive and fast compared to old-school silk-screen technologies. It is even possible to order just one sheet with you're own artwork. The dis-advantage is that this layer of color is not as thick as the silk-screened transfers. Also, in my opinion the colors are less vivid. It is possible to combine the two different types of decals on you metalclay work.

Preparing the work

I started with flat, smooth surfaces. Slightly curved is OK. A surface created with the tear-away technique works as well, but you have to be very carefull when applying the decal, not every design is suitable for decals!

The object must be totally prepared, polishing is done before. Of course you can rivet it afterwards or use other coldconnections, but no more soldering can be done. When you solder, colors tend to change.

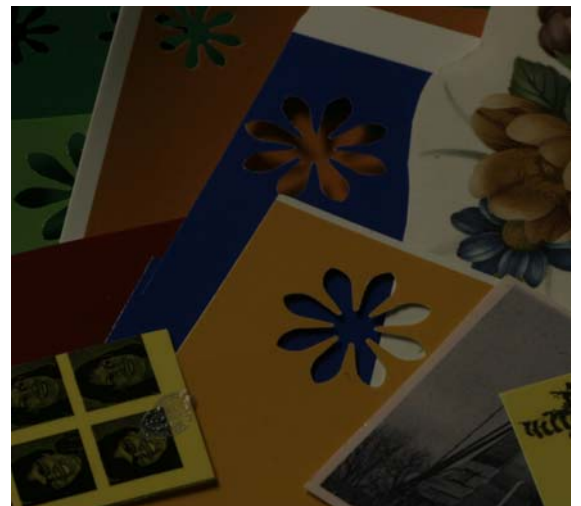
Preparing the decal

If you want to apply a custom design, cut it to the desired shape. If you use stock-decals, cut or punch it in a form you desire.

Recommended tools: Scissors, punches, craft knife (new blades), pencil and plastic templates, tweezers, etc.

You can put more layers together.

If you use multi-layers of decals in the same firing the colors will diffuse a bit. Another possibility is to fire the first layer, then apply the next layer and fire again. Then you create very straight lines. I did till 3 layers, building up my image.



Some stock-decals and custom designed decal.



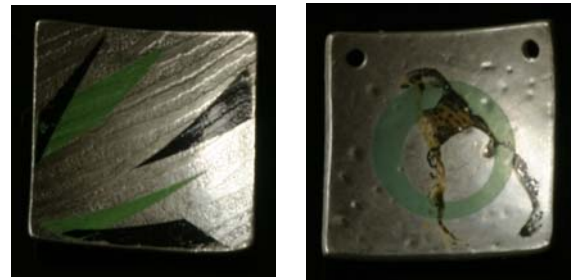
Left: See how the dark green diffuses a bit in the light green. All layers where fired in one kiln-session. Right: Separate firing for each layer.

*Application
of the decal*

Your work needs to be perfectly clean! Use some detergent and brush the surface so no greasy fingerprints or dust are left. Place the decal in a shallow tray of distilled luke-warm water and soak for about 30-60 seconds, or until the color layer begins to slide from the backing paper. The decal can now be applied to the silver. Apply the decal over the silver face-up, and slip out the backing paper from underneath. I use a tweezer to avoid hand-contact with the back of the decal.

As you position the decal on your work, you only have little time to slide it exactly where you want it. Remove the water, from underneath the decal, by using a small rubber squeegee. This is accomplished by stroking from the center of the decal towards the outer edges until all excess water has been removed, and wrinkles and air bubbles have been smoothed out.

If you don't get the water and bubbles out, you will get tiny explosions on the surface of the decal during the firing. They are called pinholes: Spot(s) that fire away, leaving a hole in the design. So always clean your silver thoroughly with clean water and soap before mounting, and squeegee thoroughly! Allow to dry for at least 4 to 6 hours (preferably 24 hours) before firing.



*Left: Transfers applied on a tear-away pattern.
Right: An example of a pinhole. Cause: trapped water under the decal.*

Firing

Firing Temperatures:

Decals are fired in a programmable kiln between 740-790°C. The temperature depends a bit on the colors you use. Green and blue can handle 770-790°C. With red I prefer 770°C or 780°C. You have to try this yourself everytime you have new decals. Testing is part of the fun!

Slow fire-scedule

This is the time scedule which ceramics use for their onglazes. This means that you slowly heat up the kiln till 400°C (300°C in an hour) than ramp till the desired temperature 780°C, stay for 10 minutes at 780°C and then cooldown. This works fine, it takes only more time but gives in my opinion the best result.

Fast fire-scedule

The enamel way of firing is necessary if you use keumboo. I pre-heat the kiln to 780°C. Then I open the kiln and place the piece in the kiln, close the door. Wear heat resistance gloves! The temperature of the kiln must be again 780°C. From then on I fire for 10 minutes, remove the piece from the kiln and cool in air. This delivers good results.

Choosing your heating-schedule, with the right timing and temperatures is important. If you over-heat, the colors will burn and turn to dull brown and greyish. If you under-heat, the surface it is not totally smooth and the color layer will not be permanent. In this case you can repeat the firing on a higher temperature.

**Safety reminder!!! Remember your kiln is hot!
Take all necessary precautions for working with a hot kiln.**

Color

Making a test strip for the colors

If you buy new transfers you will have to make a test strip. Also you have to test your kiln, because temperatures can vary.

For a test strip cut out all the new colors and put them on a small piece of fine silver. Slow fire it at 780°C.

Now compare the colors. If some colors change to another color, putting a gold layer between can fix this problem.

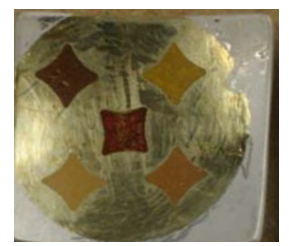
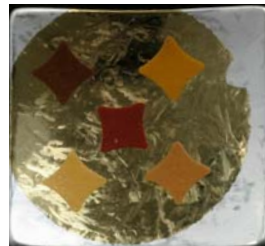
Green, blue, black and yellow are the easiest colors to achieve. Red and purple are a bit more tricky. Often they will turn to a dull brown color when applied to fine silver.

You can avoid this by first applying a layer of gold. The Keumboo technique works very well for this. The extra layer(s) of gold deliver the right result.

With keum-boo you will have to use the fast firing schedule, otherwise the gold will diffuse into the silver. (tip: Celie Fago's book about Keumboo)



*Up: before firing down: after firing at 770C
Not all colors remain. Red and purple are gone.*



*Left: before firing right: after firing at 760C
This was a test with keumboo underneath.*

Processing after the kiln

When removed from the kiln and cooled down I polish the artpiece with a soft silvercloth. It is even possible use polishpapers.

* Using LOS is also possible afterwards as it doesn't affect the colors

* How to remove a fired decal:

If you want to remove a decal which has been fired, you have to use sandingpaper.

Also the habras discs are very helpful to erase the decal. Preferrable you clean the piece in a ultrasoon to remove all the dirt. When clean, you can re-apply your decal.

* 'Halo' Effect: After firing, there appears to be a slight shadow around the edge of the decal. This is caused mostly by inorganic impurities in the water. Use distilled water in the future.

A disk with Keumboo (2 layers), red decal and Liver of Sulfer



Long strips of decal are wind around these earrings to create this pattern. Fired on mica.



Computer skills

The company's who do digital printing will give you the exact specs needed for their printers. Often they can be found on the website or they are send to you if you ask.

Most common guidelines are:

Use Adobe Photoshop/Illustrator or comparable software to create a canvas:

Tip: GIMP and Inkscape are free programs

Canvas size: 11" x 15.5" (this is normally the printable area, ask the company!)
40 x 20 cm (A small A3)

Background: transparent

Resolution: 300dpi

Color Mode: CMYK (a special ceramic CMYK profile will be applied by the company)

File format: TIFF or PSD (do not compress your file -- no JPEG)

Create or import your images (photos, drawings, text, etc.) into this canvas. Lay out your decal sheet -- fill it to the edges if you want. Full color or duotone, it doesn't matter. Put it all in there.

Then burn it on a CD or DVD and send it to the company of your choice.

An other option is to work in a program like QuarkXpress.

Import the pictures, which you have converted to CMYK, 300 dpi and in tiff format.

Then make a PDF of it. This will make the fill smaller and can be send by mail.

Some key terms explained

- Color Mode - the color profile that is assigned to a digital file (sRGB, Adobe RGB, CMYK, etc).
- CMYK - the colors used in the printing process: C=Cyan M=Magenta Y=Yellow K=black
- RGB - the colors used in tv and monitors, etc : R=Red G=Green B=Blue
- Cropping - deleting part or parts of an image to emphasize the main subject and composition.
- Density - total color value; the vibrancy or depth of a color.
- Megapixel - a million pixels; camera resolution is measured in megapixels.
- Pixel - "picture element," the smallest part of a recorded image. An image is made up of millions of pixels.

File Compression

Software algorithms that create significantly smaller image files sometimes with changing the number of pixels in an image. If pixels are chanced we call it a lossy file compression. This actually reduces the amount of information in the data, rather than just the number of bits used to represent that information.

JPEG File - the most common type of compressed image file format. It is a "lossy" type of storage because even in its highest-quality mode data compression reduces file size.

TIFF File - a lossless image format used in digital photography.

RAW File - image format that allows maximum exposure and color correcting of the digital image file.

PDF File - Portable Document File, You can make them with a program called Adobe Acrobat. The main purpose is to make a small file without losing data that is interchangeable between different platforms.

A final note

I hope that this booklet will motivate you to start experimenting with the exciting possibilities the transfer-technique offers. Good luck with it and please share your experience with me.

If you want more info, feel free to contact me by mail.

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In 2007 Helga wins the 2nd place of the Small Treasures competition in Europe with this necklace using the decal technique.

This transfer presentation
is made by
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