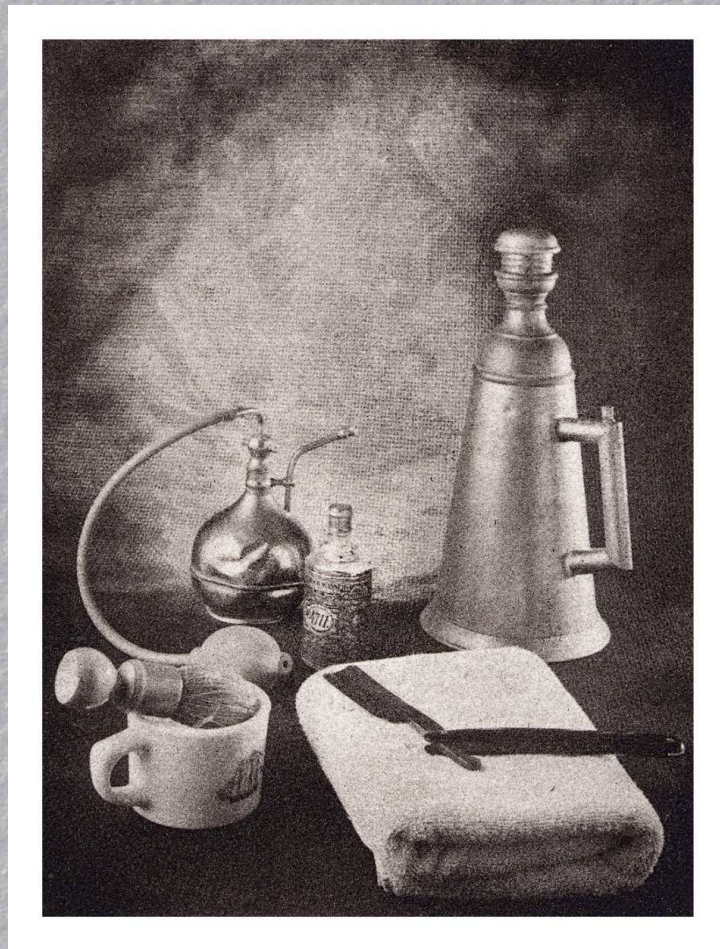




OIL PRINTING



Photographic printing process introduced in 1904 , and adapted in 2010 to current products and equipments by René Smets

OIL PRINTING

The oil process was introduced in 1904 by Rawlins, as a simplified variation of the collotype process. Robert Demachy and Constant Puyo were the first to apply it to fine art photography. Around 1907, the process was widely used in photography.

When a dichromated gelatin is exposed under UV light, the exposed parts harden and will accept an oil-based ink, which will be repelled by the non-exposed parts saturated with water after soaking.

The end of the bromoil process?

When the production of non-supercoated papers such as Kentmere, Bergger etc.. was stopped, I had no alternative but to try making it by myself.

There are two ways of making pictures with oil-based inks:

1. oil printing
2. bromoil printing on liquid emulsion.

In this manual I will describe oil printing, the way I currently do it. The text covers the following chapters:

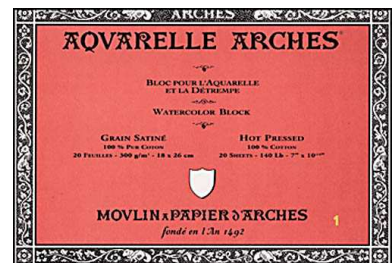
1. the paper
2. the emulsion
3. coating
4. sensitizing
5. the exposure
6. processing
7. inking

1. THE PAPER

Once again, we are facing the same scenario: earlier papers designed for this process are now out of production.

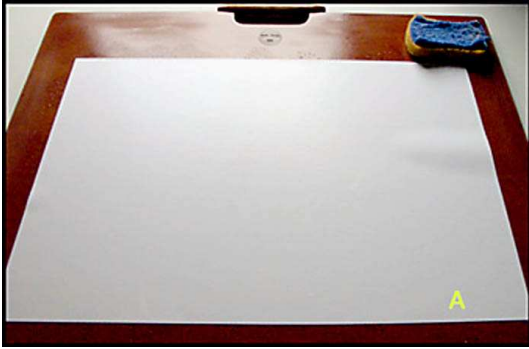
The possibly remaining supplies are not suitable any more, as their gelatin coating hardened with time passing.

I had to experience myself how most of the sheets I had on my shelves did not work any more for this process.



The paper to be used has to be of good quality, such as for instance Arches' watercolour paper (*pict. #1*). Even this paper has to be sized (see my description of carbon printing elsewhere on the Picto Benelux website). Papers coated with a Gesso layer work fine also.

MY GELATIN SIZING.



While preparing papers for other processes with Gesso, I taught that it should be possible to use the same procedure for sizing with gelatine.

I moistened a sheet of paper and left it stretching for about ten minutes.

(pict. A).



I then fixed it on a flat surface with gummed paper tape (pict. B).

This being done, I applied a coating of my usual gelatin mixture, made from 30 grams of gelatin per liter of water to which are added 5 ml of 1% chromium alum.



After a couple of hours, the sheet is dry and perfectly flattened by the shrinking.

I repeat this twice. (pict. C).

2. PREPARING THE GELATIN EMULSION



It is advised to use a gelatin with a Bloom grade of 250.

My formula:

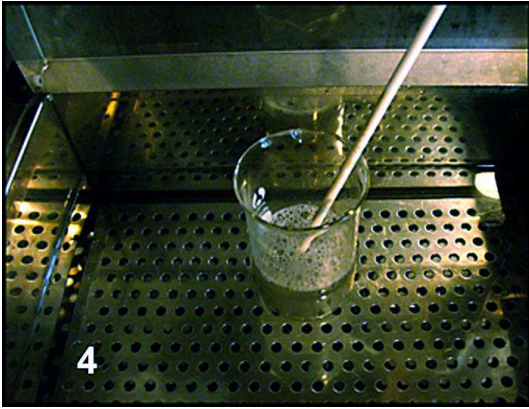
distilled water	300 ml.
gelatin	9 gr.
starch	3 gr.
Chromium alum 1%	5 ml.

(pict. #2)

The starch is melted in a small part of the water - 100ml at 75°C for instance. The



Starch



liquid should not boil by any means. (pict #3)

As for the sizing, the gelatine is added to the stirred cold water and left to soak for a couple of hours. After this, the gelatin is warmed at 55°C in a bain-marie. This will cause its melting; the warm starch and chromium alum can then be stirred into it.

(pict. #4)



Finally, the liquid is filtered.

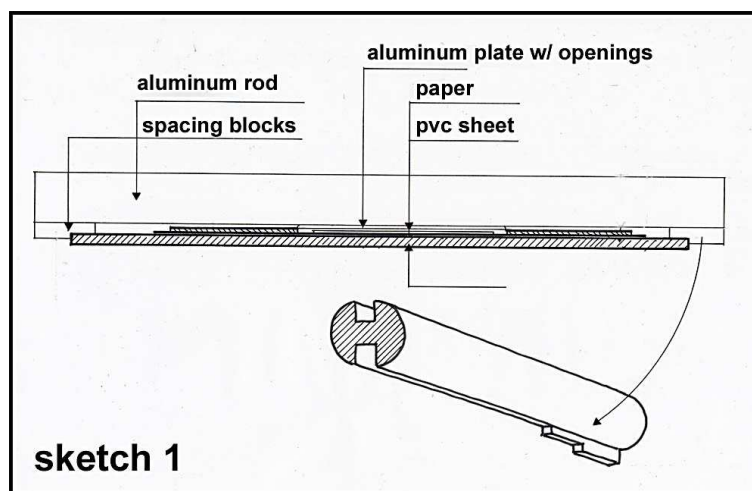
Filtering a liquid thicker than water cannot be done just with a simple paper filter. I use an icing syringe wherein I put a couple of fine filters; the liquid can then be forced under pressure through the filters. (pict #6).



In order to avoid any air bells, I stir the solution for an hour with an automatic stirrer (pict #5).

REMARK.

While this mixture cools down, the starch tends to settle on the bottom; it therefore has to be stirred again immediately before use.



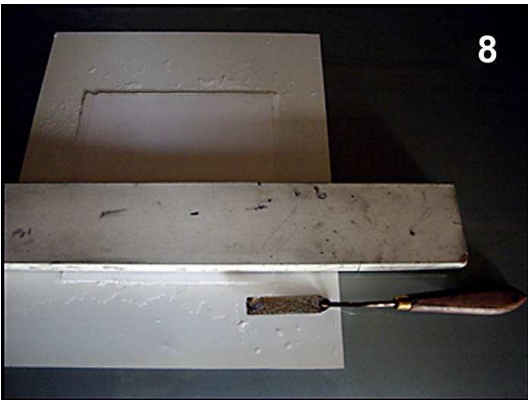
3. COATING PAPER WITH EMULSION

When the emulsion is warmed to 55°C, it can be poured without using a warming plate; I happen however to warm the glass plate with an hairdryer.



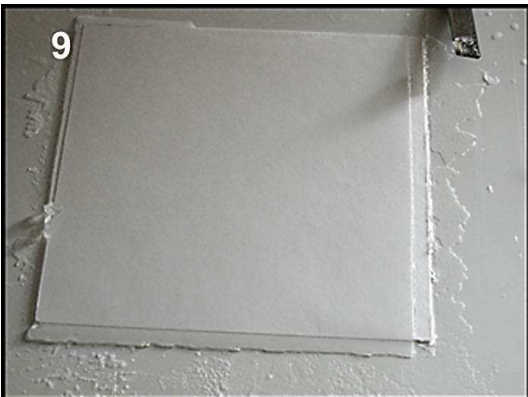
I use a glass plate on which I put a 0,3mm thick PVC sheet; this sheet adheres to the glass plate when wet (sketch #1).

The paper is soaked until the paper is fully stretched. It is put on the pvc sheet and squeegeed. Its upper surface is blotted with a roll of paper towels.



A 1mm thick aluminum plate is put on top of the pvc; this plate has a hole slightly bigger than the paper surface. Using such a plate makes it possible to get a nice, regular layer that doesn't run out.

The warm emulsion is poured in the middle of the paper and evenly spread with an aluminum rod.(pict. # 7)



This rod has spacers maintaining a constant distance between the rod and the paper, which ensures a constant thickness of the coating.

After a few minutes, the layer has coagulated and the pvc with the coated paper can be removed from the glass plate. I put the pvc with the paper on another cold glass plate for further coagulation.

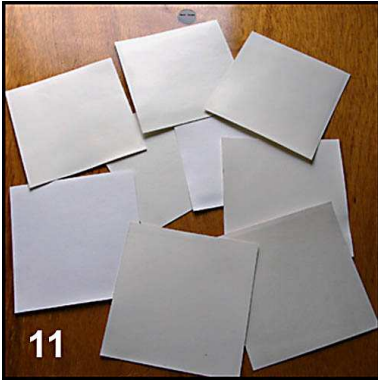


When the layer has fully coagulated, I pass a knife all around the paper and lift it from the pvc. I take a small board equipped with spacers which can be be put over the paper without touching it.

Using a painting knife, I scrape the gelatin off two opposite paper borders, over a width of approximately 1cm.(pics #8 & 9)

This gives two clean sides, to hang and weight the paper.

I built special hanging clamps allowing the paper to dry without curling.
(pict. #10)



After drying, I slightly moisten the backside of the papers and stack them between two layers of blotting papers. The whole stack is then put for one day under a press; after this, they are perfectly flat.

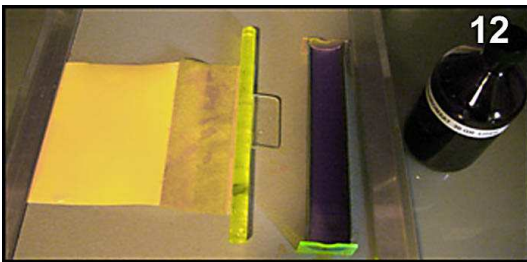
(pict #11)

4. SENSITIZING

One after another, the papers are put on a pressboard fitted with spring-action clamps. The papers are sensitized with the following solution.

water 1 liter
potassium dichromate 30 gram

temperature 15°C approx.



In order to use only a minimal quantity of this solution, I built a container from half a pvc pipe on which a rag of VLIESELIN[®] nonwoven fabric was fixed with hook-and-loop fastener ("Velcro").

This fabric absorbs a significant quantity of liquid, and follows perfectly the paper undulations when the latter isn't perfectly flat. (pict. #12)



This way, the paper can be dried faster, as it is not fully wetted, only the gelatin layer being soaked with the potassium mixture. It takes about one minute spreading to get a good saturation of the gelatin.

The sheets can then be hung to dry.

(pict. #13)

The drying can be accelerated by using a

fan blowing cold air.

5. EXPOSURE

As you know, a big negative is needed.

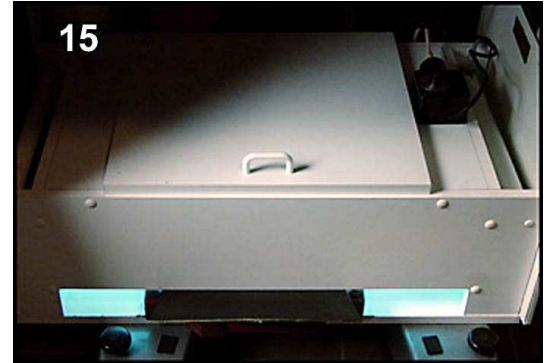
How to make such negative can be found in my description of carbon printing.

Oil printing is a contact printing process; a printing frame is needed.



14 The paper is exposed under UV light. I use a 120 watt HPR lamp from Philips. Correct exposure has to be determined by testing; I use to expose for 4 to 6 minutes at a distance of 25cm. (pict. #14)

When working on a series of prints, I do also use a UV light unit with six 25 watt tubes. (pict. #15)



16 The UV light causes the dichromate layer to turn brown. When the highlight details in the image become just visible, the exposure is correct.

(pict. #16)

6. PROCESSING



17 After exposure, the paper is washed in cold running water to remove most of the dichromate yellow stain. Any residual stain will be removed afterwards in a special bath.

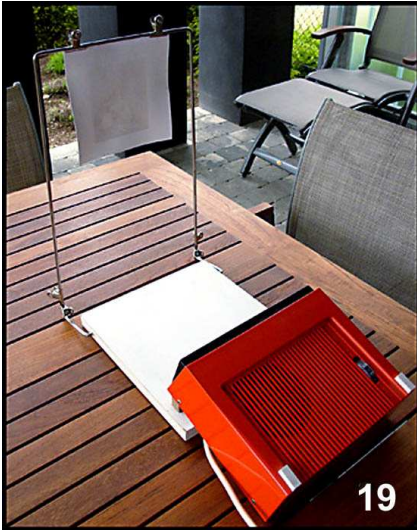
The washing removes the particles of non-hardened gelatin, leaving a relief image. (pict. #17)



18 To remove the slightest trace of yellowish stain, I use an acid bath made from 10ml of sulfuric acid per liter of water.

After a few seconds, the stain disappears, and a faint image remains. The print has to be washed thoroughly in water.

Picture 18 shows the result.



Once the sheets thoroughly dried, they are called "MATRIX".

To completely dry the sheets, I use for a few minutes a ventilator blowing hot air at a short distance.

When gently tapping the matrix with your fingers, a clear sound should be heard: this means that the paper is completely dry.

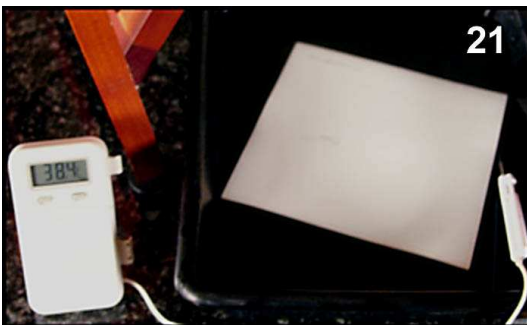
(pict. #19)

8. INKING.

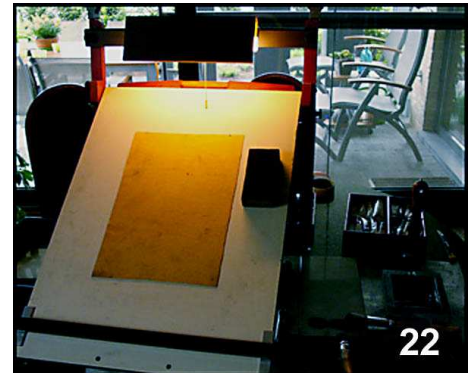


I am using "Lefranc & Bourgeois" typography ink.

I start soaking the matrix for about 10 minutes in water at room temperature (20°C); I then increase gradually the temperature to about 40°C. (pics #20 & 21)



The matrix is posed on a glass plate and a "Vileda" synthetic chammy leather cloth. This will prevent the matrix from drying out too fast. (pict. #22)



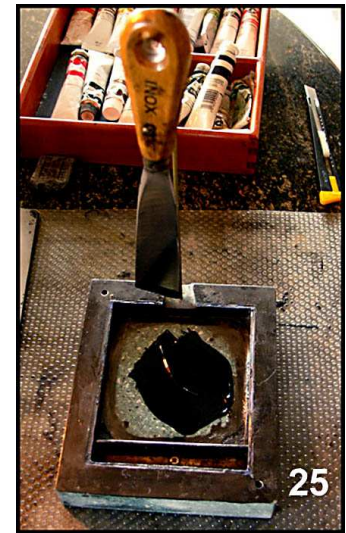
The matrix is dabbed with a sponge to eliminate the slightest trace of water on its surface.

The borders are covered with pvc squares, in order to preserve their whiteness.

(pict. #23)

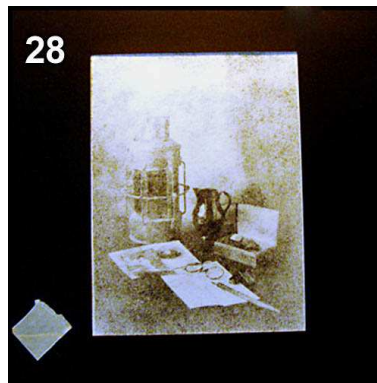
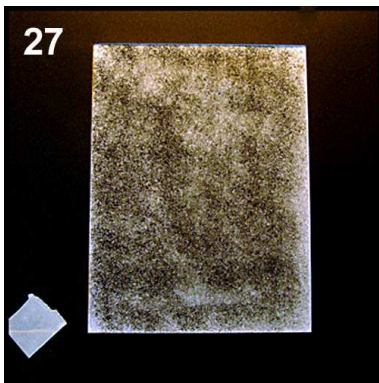
The worth of a pea of ink is squeezed from the tube on the palette and spread out flat with a painting knife. The inking brush is pressed down on the spreaded ink and then dabbed on a clean place of the palette.

(pics #24-25-26 on next page)



Now the brush is dabbed crosswise on the matrix in order to spread evenly the ink. When this is done, the ink is forced into the gelatin with a marten brush fixed on a handle; this hammering action has to be done in a supple way.

After the first layer, the print is inked again. In doing so, make sure to preserve the highlights. When finished, the ink is "hopped" again into the gelatin. (pics #27-28-29)



Accent lights can be enhanced with a kneaded eraser or a moist sponge. When sufficient contrast is achieved, the print is ready and can be dried.

With some paper types, a yellowish dichromate stain might remain after finishing.

This can be minimized with a bath of 1% potassium alum, followed by a thorough wash.



Once dry, the print can be mounted and matted. (pict. #30)

René Smets
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translation: J. Kevers

Picto Benelux

Picto is an informal group, open to everybody in the Benelux who has an active interest in any photographic processes developed from the very beginning of Photography. The aim is to revisit them, while respecting anyone's creative approach.

<http://www.picto.info/>