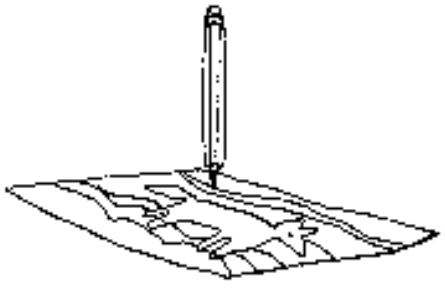
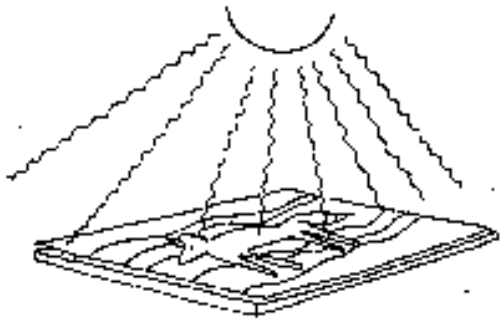
Printmaking with Solarplate (photopolymer plates)

Photopolymerplates are used in letterpress printing. In the 1960's these polymer plates started to replace traditional metal plates en lead characters, effictively freeing industrial printers from the hazards of poisenes lead fumes generated when making tead type on composing machines. (Monotype, Linotype). First it was used in "Flexography" (=printing on flexible material like cardboard boxes and alike). Later it replaced moore and moore traditional plate making and lead type. In commercial printmaking these plates are only used in the relief printing process, that is why the plates have a certain thickness. A photopolymer plate consists of three layers; the steel backing plate, of appr. 0,3mm thick (only a support), the photopolymer layer (appr. 0,3mm), and on top a mylar protective transparent layer. Photopolymer hardens out under the influence of UV-light (Ultra-violet). Actually; unexposed material are "monomers", unlinked molecules which can be washed out very easily with water (+a bit of soda); exposed material is "polymers" because all the molecules are linked together (=hardened), and cannot be washed out with water+soda.

Dan Welden (an American printmaker) found that by exposing a plate in the sun, he could make a high quality intaglio plate very simply and cuickly, thus the name "solar plate". Now the technique is widely known as "solarplate printmaking" or "solar etching", a term that describes so well the way many printmakers are working - exposing plates in sunny backyards and spending more time in the fresh air.

Solarplate printmaking:

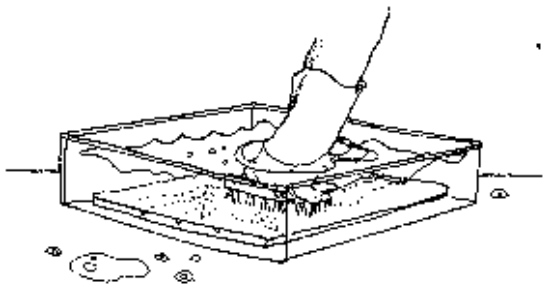




The transparency is placed face-to-face with the solarplate and exposed in the sun (exposure

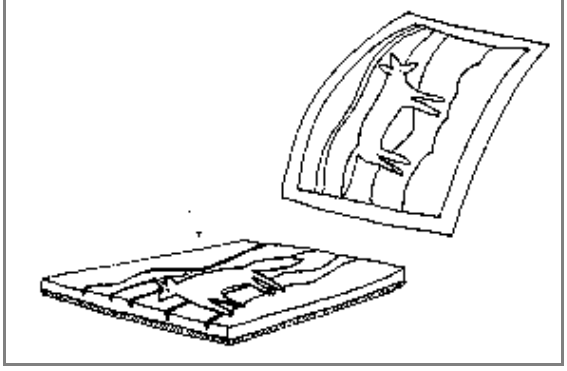
A printmaker draws (paints) on a transparency (mylar, drawing foil, grained glass, etc).

unit). UV-light penetrates clear areas of the transparency and harders the polymer, while areas beneath the opaque lines of the drawing remain soluble. (If the original is not a line drawing, an extra exposure through an aqautint screen is needed)

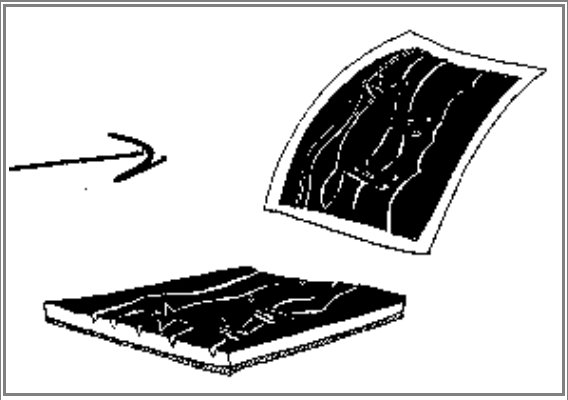


The plate is scrubbed in tap water (+ a bit of soda) and the soluble areas are washed away.

Now the plate needs a final exposure to harden out all the remaining unhardened molecules. The plate has grooves and lines similar to an etched metal plate



The printmaker inks the grooves and wipes the surface to create an intaglio print, or.....



the prinrmaker rolls ink on to the surface and creates a relief print.

Exposure equipment

- Contact frame. These frames can come in many shapes. The simplest form is just a foam "bed", with on top the solarplate, transparent, a glass plate, and if need some extra weight to press it all together. The only condition is that there is not a gap between the tranparent and the solarplate, because that will lead to an unsharp image. Professional or home made vacuumframes

are better of course.

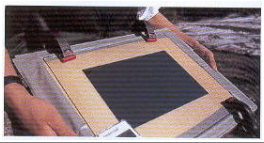
- Exposure. Sunlight can be used, but is not always available and gives trouble calibrating your exposure times. Ready made UV-exposure units are available; Professional units have a vacuumframe and a UV-bulb lamp, or a set of UV-tubes. You can start with a simple UV-bulb lamp+ induction coil. (Polymetaal # 022545)

Solarplate in Intaglio Printmaking, general outlines:

Dust the plate with talc powder. (to avoid sticking)

Wipe off excess talc powder

Place the aquatint screen face down on the solarplate between glass and the support.
An aqautint screen is not needed if a line drawing is concerned.



Clamp and expose.
Clamping is to avoid clearance between the aquatint screen and the solarplate. If the support is horizontal, placing some weights on the glass plate has the same affect. Exposure can be done in the sun, as well as in a UV exposure unit.

After removing the aqautint screen, place the transparency with the worked surface in contact with the solarplate.

Clamp and expose

After blotting, drying and post

Take the protective foil aff, and wash the plate with tap water (+some soda)

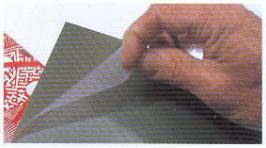
After blotting, drying and post-exposing, file the corners of the plate and begin inking.
Post exposure is very important, to harden out all the remaining monomer molecules in the plate.

Wipe with tarlaton and finish with pages from a telephone book.

Print

For Intaglio printing, photopolymer film is a good and cheaper alternative. These films come on rolls and are called "ImagOn-Ultra" "Puretch" "Z*Acryl-film" "Photec" etc. These films are traditionally used in the electronic industry to print circuit boards. Photopolymer plates were originally developped for commercial relief printing (Flexography). The thickness of the layer is appropriate for relief printing; but far thicker then needed for intaglio printing. Photopolymer films are appr. 30 -50 microns thick (0,03 - 0,05 mm). Films are too thin for relief printing, but can be used very well for intaglio printing. (Both as "Intaglio Type" (=photopolymer layer carries the ink) as well as photopolymer film as an "etching resist")
Intaglio photopolymer films are laminated on to a support, which is normally a copperplate.

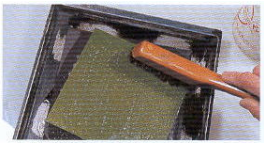
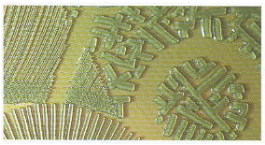
Scratching through opaque film



Peeling the plastic coating from the solarplate

Placing the image face down on

Exposing the plate to the sun (or

the plate	UV-unit) in a contact frame
 Pouring water (+some soda) on the plate	 Scrubbing the plate. Observe that the water has removed the polymer in the unexposed areas.
 Post exposure to harden the remaining monomer molecules, Rinse the plate in water and blott the plate.	 Using a hair dryer to dry the plate, or use a drying cabinet
 The relief depth is apparent in raking light	 Ink the plate. The plate can be printed on a relief press or with a spoon or a baren. (Japanese style)

The above gives just an overview of solar plate printamking. More information can be found in the following books:

- Printmaking in the sun. An Artist's Guide to Making Professional-Quality Prints using the Solarplate Method. Written by Dan Welden and Pauline Muir. 2001 Watson-Guptill New York.
- Printmaking with Photopolymer Plates. A new, safe, versatile printmaking technique for artists and students. Written by Dianne Longley. 1998 Illumination Press. Adelaide.