

PIGMENTED PROCESS TRANSFER U. S. COAST AND GEODETIC SURVEY

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Recent developments in the U.S. Coast and Geodetic Survey include a pigmented process transfer technique which has proved so successful, especially in the compilation of nautical charts, that it has now superseded the bromoil transfer procedure described in the May 1953 issue of the *Review*. It is the purpose of this paper to describe the new process.

In general, the technique consists of first making a film negative to compilation scale by photographing the source material. The image on this negative is then processed (by contact) to a sheet of treated, transparent ungrained vinylite. Next, the vinylite sheet is powdered with an oil pigment of any desired color (generally blue for nautical chart compilation), resulting in an image which may be transferred to another medium by burnishing.

More specifically, the pigmented transfers for use in the compilation of nautical charts and similar purposes are prepared in the following manner:

First, a sheet of .005-inch transparent ungrained vinylite is mounted on a lithographic plate by taping the corners with masking tape.

The sheet is then placed in a tank and cleaned with the following solution:

- 4 oz. nitric acid
- 4 oz. gum arabic 14° baume
- 1 gallon water.

After this cleaning, the vinylite is ready to be coated. A supply of the coating solution is prepared as follows:

1. Mix Solution A, composed of:
 - 3 liquid ozs. Lepage's photo engravers glue
 - 4 liquid ozs. ammonium bichromate 14° baume
 - 1/2 liquid oz. ammonia water 28 %
 - 9 liquid ozs. water
2. Mix Solution B, composed of:
 - 2-1/2 ozs. Pittman U.V. Powder
 - 30 liquid ozs. water
 - 1 liquid oz. ammonia water 28 %

3. Add 12 liquid ozs. Solution B to 5 ozs. Solution A, stirring well, and filtering if necessary. This is the Coating Solution.

The vinylite is coated by first placing the sheet in a vertical whirler and rotating at 50 R.P.M. While rotating, the sheet is flushed with water and then

evenly coated by slowly pouring the coating solution on the center of the whirling sheet.

The sheet is next whirl dried. Drying may be accelerated by applying moderate heat while the vinylite is whirling. In the Coast and Geodetic Survey this is accomplished by using heating elements installed in the bottom of the whirler.

When the coating is thoroughly dry, the sheet is removed from the plate and its back cleaned and dried.

It is then exposed in a vacuum frame under the desired negative. Care must be taken that the image will be reverse reading. This is accomplished by placing the emulsion side of the negative in contact with the back of the sensitized vinylite sheet and exposing through the vinylite. Exposure should be approximately 1 minute with a 35 amp single carbon light at 3 feet distance.

A developing ink, prepared by dissolving Fuchs and Lang Milori Blue (or similar offset ink) in about 10 times the amount of turpentine to achieve a good spreading consistency, is applied to the exposed print in a uniform application, then fanned dry.

The print is next placed in a tank and flushed with 1 ounce ammonia 28 % to 1 gallon water. A rocking motion will aid the development. Running water is then used to complete the development. The print may be lightly swabbed with cotton. This procedure should be repeated as required until a sharp print is obtained, although the print must not remain in the tank an excessive length of time.

After development the sheet should be dried by fanning or blotting as necessary.

When *thoroughly* dry, the print is powdered with Grumbacher's Prussian Blue Oil Pigment (obtainable from most art supply stores) and then wiped clean with cotton.

The image is now ready to be burnished to any desired medium. Two, or possibly three, transfers can be burnished from the same image. This is considered adequate for nautical chart compilation.
