

CYANOTYPE PROCESS

Invented by [Sir John Herschel](#) in 1841, this simple process produces a continuous tone image of Prussian Blue using a sensitizing solution of ferric ammonium citrate and potassium ferricyanide. These iron salts, when exposed to natural or artificial ultraviolet light, are reduced to their ferrous state, producing a high contrast blue image when oxidized. Oxidation is hastened by immersion in running water, which also washes away the unused iron salts.

The process was eminently suited to its traditional role in reproducing technical drawings. Its most common use was in engineering and architecture until the advent of modern photocopyers. However, it was a versatile process and was used throughout the 19th century from Anna [Atkins'](#) photograms of plants and seaweed for her books on botany (1843-55) to Henri LeSecq's still life studies of the 1850s. Photographers at the end of the century used cyanotype paper for proofing negatives.

The Process

Solution A: 6.5 grams ferric ammonium citrate (green) in distilled water to make 25 ml total

Solution B: 2.3 grams potassium ferricyanide in distilled water to make 25 ml total.

Note: Today, distilled water is known as 'Purified water'.

Store separately in brown glass bottles, away from light. Filter before use, and mix in equal proportions A to B.

Paper

Suitable for many types of art papers. Try a good quality printmaking/drawing paper like Fabriano 5. Coat in subdued tungsten light, and dry away from light and heat. Print by contact (in a printing frame with a full-sized negative) in sunlight or by a mercury vapour lamp until the shadows look bronzed. Exposure should be at least one stop more than required.

Develop by immersing in running water, and wash until the chartreuse stain of the ferric ammonium citrate has completely disappeared. Over-washing will erode the image. A 3% bath of hydrogen peroxide will speed up oxidation.

A few drops of bichromate added to wash water will increase contrast and can appear to intensify the printed image. Avoid hydrochloric acid 'intensifier' – the acid can combine with the Cyanotype solution to produce cyanide gas.

Working with the Cyanotype process

Setting up (preparation)

1. Working Area

Lighting for working: avoid daylight and fluorescent lighting, use low level tungsten light and limit total exposure.

Working Surfaces: clean, and covered: newspapers, paper towels

Sensitizing

Mixing chemical solutions:

2. Measuring: clean dry paper for weighing dry chemicals, clean containers for measuring liquids
3. Labelling: identify, give proportions, date

Coating chemical solutions:

4. Tape down paper
5. Brushes: Buckle's brush for smooth dense paper, soft hair brush for rough, porous paper or cloth
Glass rod: for smooth, even coatings
Roller: foam for cloth

6 & 7. Coating with a brush – use horizontal and vertical brush strokes

8 & 9. Coating with a glass rod: use syringe to distribute solution: draw solution top to bottom

Drying:

10. Drying: line and clothes pegs, boards or perspex
Floor surface: protect with newspapers

Storage:

11. Protect from light, heat, damp. Limit duration of storage before exposure – the coating will oxidize, and highlights will degrade.

Exposure

12. Printing frames: traditional Home-made with bull clips, perspex, bubble wrap, melamine
13. Negative: beware chemical build-up on negative – protect with mylar sheet or cling film
14. Step wedge for timing
Basic guide: 125 watt uv lamp at 18" = 30 min
Timing variations: humidity, build up of heat
16. Exposed print

Development

17. In photographic tray, cold running water

Fix

18. Oxidation 'fixes' the print

Drying

19. Hang on line or flatten against tilted, waterproof surface

Note: To coat paper, try one of the following:

A soft, broad brush (separate brushes for different processes).

A 'Buckle's brush': cotton wool tied with string – the string is pulled through a glass or plastic tube so that the cotton wool forms a tuft at one end. This avoids the problem of contamination, as the cotton wool is discarded after each sensitization.

A glass rod – use a dropper or syringe to draw a line of sensitizer along the top of the rod. Hop the rod over the line and slowly draw down the paper to the bottom. Hop, then gently push to the top. Repeat until coated.

Always tape the paper down to the table surface before coating.

Toning:

Gallic-iron

Purple – lilac:

Bleach print in 5% solution of ammonium hydroxide

Wash thoroughly and let dry to allow ammonia to evaporate

Tone in saturated solution of:

gallic acid (1%) or tannic acid (20%)

Wash, and dry quickly

For a violet tinge, immerse in cold solution of borax

Brown – black

Bleach 10 ml of 18% solution ammonium hydroxide

100 ml distilled water

Toning: 10 gms tannic acid

500 ml distilled water

Avoid use of sulphuric acid for greenish prints – combination with cyanotype solution may result in formation of cyanide gas.

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