

Photography I Study Guide - Developing film & Making a Print

Equipment used for making Prints:

enlarger
enlarging lens
enlarging timer
filters
focusing magnifier
processing trays
print tongs
safe lights
easel
brush or air blower
film cleaner and soft cloth
print washer
print drier
paper trimmer
graduates, funnels, and storage bottles
print squeegee
piece of glass
towel

Equipment used for developing film:

reel and tank
thermometer
scissors
can opener
clothespins and string
graduates or measuring containers
storage containers
rubber gloves
negative envelopes
changing bag (optional)

Printing Papers:

Like film, printing paper consists of a light - sensitive silver - halide emulsion on a base or support material. Film uses a base of clear plastic, while printing paper uses a base of white paper.

The major considerations in choosing from the wide variety of printing papers made are as follows:

Base Type

Weight

Tone

Surface

Contrast

Base Type: Printing papers are available in fiber and resin - coated bases.

Resin - coated (RC) papers are coated on both sides of the paper base with a thin layer of clear plastic.

Weight: Printing papers are classified according to the thickness of their base, either as single, medium, or double weight. RC papers are usually medium weight; fiber based

papers are either single or double weight.

Tone: Tone refers to the color bias of the printing paper. Some papers are warm tone, tending toward brown, while others are cold tone, more neutral black.

Surface: Most papers are available in wide variety of surfaces, most commonly: glossy, luster, semi - matte, and matte. The glossier the surface, the sharper the image.

Contrast: Contrast refers to the difference between the light and dark tones in a print. Low - contrast (soft or flat) prints are gray, with few bright or dark areas; high contrast (hard) prints are mostly light and dark, with fewer gray areas.

Printing Chemicals:

Developer
Stop Bath
Fixer

Processing Chemicals:

Processing chemicals for prints are basically the same as those used for processing film. The one exception is the developer. Film and paper developer perform the same function (developing the latent image), but their chemical composition is slightly different so it is necessary to use separate film and paper developers.

Film Developer: The primary processing chemical is the developer, which reacts with the film to make the latent image visible. The developer works to bind together only the exposed silver crystals and turn them into clumps of dark metallic silver. The greater the film exposure, the denser the silver.

Stop Bath: Developer continues to develop film until it is neutralized by stop bath, which usually consists of a plain water rinse or a mild solution of acetic acid.

Fixer: After the stop bath, film must still be protected from light or the unexposed silver will become exposed and darkened. Fixer removes the unexposed silver and allows the film or print to be viewed in room light.

Wetting Agent: When the film is washed to hang and dry, water may cling to the surface and dry and leave streaks or spots. A brief treatment in a solution of wetting agent reduces surface tension on the film, and allows water to flow more rapidly from the film without clinging to it.

The Negative:

A good negative is the key to a good print. Well-exposed and well-developed negatives print easily, while poorly exposed and poorly developed negatives print with difficulty.

Contrast is the difference between highlight and shadow areas.

High contrast subjects have dark shadows and bright highlights.

Low-contrast subjects are gray, lacking either very dark shadows or very bright highlights, such as on cloudy days or with shaded light, and are said to be flat.

Learning to evaluate a negative can be very helpful. Are the exposure and development correct? How will it be rendered as a print? With low or high contrast? With good or poor shadow or highlight detail? For guidance, refer to the rule:
“Expose for the shadows and develop for the highlights”.

To evaluate film exposure, look only at the shadow areas of the negative. Ignore the highlights. If the shadows appear dense, the negative has been overexposed. If they appear thin, the negative has been underexposed. A well-exposed negative has the minimum density necessary to render full shadow detail. Shadows should be light, but not clear.

To evaluate film development, ignore the shadow areas of the negative and look only at the highlights. Well-developed negatives should be dense but not opaque. If the highlights are thin, the film has been underdeveloped and the negative will lack contrast. If they are too dark, the film had been overdeveloped and will likely have a lot of contrast.

Understanding Print Exposure:

When printing paper is exposed to light projected through a negative, it forms a latent image. Like film, this image is not visible until developed chemically. The more light that strikes the paper, the darker the printed image.

More light passes through the shadow (thin) areas of a negative than through its highlight (dense) areas. Thus more light reaches the printing paper to render shadows rather than highlights, so when developed, shadows are dark and highlights are light on the print. In effect, the printing process reproduces the light, gray, and dark areas much as in the original subject.

Just how much (light) exposure is needed to make a print depends on the density of the negative. The denser the negative, the greater the amount of exposure needed.

There are two primary factors in controlling print exposure:

Aperture of the (developer's) enlarging Lens
Print Exposure Time

These correspond roughly to the controllers of film exposure: the aperture of the camera lens and the shutter. The same relationship exists. If one is increased, the other must be decreased equally for the exposure to remain constant. A print exposure of f11 at 20 seconds gives the same result as an exposure of f8 at 10 seconds. The time is cut in half, but twice as much light travels through the lens.

In a camera, correct film exposure is figured with the help of a light meter. In a print, exposure is determined with the help of a test strip.

Making a test strip: A test strip is a section of printing paper with several different exposures made from a single negative. Once the test strip has been exposed and developed, the results can be used to determine the overall proper exposure time for a particular negative.

1. Close down the lens aperture to mid way (around f8 or f11).
2. Take out a sheet of printing paper and cut it into horizontal strips.
3. Lay down a single strip of paper in the easel, emulsion side up.

4. Use an opaque piece of cardboard to cover most of the strip of paper.
5. Set the timer for two seconds and expose the test strip while covering the majority of the strip with the opaque cardboard.
6. Repeat this process several times until the entire strip has been exposed to light.

Contact Printing:

A contact print is a print the size of a negative. A contact sheet is a large sheet of paper, usually 8" x 10", containing a series of contact prints.

"Contacts" are best used as proof sheets. An entire roll of film is contact-printed onto one single sheet of paper. Each contact print is then examined for its value, and only those that look promising need be individually printed, saving much time and money (in wasted chemicals and printing paper).

1. Position the enlarger housing near the top of its post, so it projects a wide circle of light when turned on. The aperture setting is optional; start with f8 or f11.
2. Place a fresh sheet of 8" x 10" printing paper, emulsion side up, at the base of the enlarger. Do not use an easel.
3. Position several strips of negatives emulsion side down in rows on the paper.
4. Then gently lower a clean sheet of glass over both the negatives and paper to hold them flat and tight against each other.
5. Turn on the enlarger for a predetermined period of time. Try f8 at 5 seconds.
6. Once exposed, process the contact sheet like any other print.