



Starter kit guide:

B&W



How to Develop Black and White Film at Home

Developing black and white film at home is simpler than processing color film but still requires the right tools, attention to detail, and patience. Here's a step-by-step guide.

What You Need

Included in a starter kit:

- **Film Developing Tank** – A container that holds reels inside and allows chemicals to be poured in and out.
- **Reels** – Used to load your film. Ensure they're suitable for your film format (35mm, 120, 4x5, etc.).
- **Darkroom or Changing Bag** – Used to load film onto the reel and place it in the tank in complete darkness.
- **Thermometer** – Ensures the chemicals are at the right temperature before pouring them into the tank.
- **Film Clips** – Used to hang the film for drying.
- **Measuring Cylinders** – For measuring and mixing the chemicals.
- **B&W Chemicals** – Typically includes developer, fixer, and wetting agent. Follow the chemical producer's instructions for mixing.
- **Storage Bottle** – Used to store mixed fixer. Other chemicals are typically "one-shot," meaning they should be discarded after use.

Not included in a starter kit:

- **Scissors** – Needed for 35mm film to cut the end of the film inside the changing bag.
- **Distilled Water (optional)** – If your local water is mineral-rich, it might be helpful to use distilled water.
- **AGO Film Processor (optional)** – Helps maintain temperature control throughout the developing process.
- **Timer (not needed with AGO)** – Used to track processing times.

Step-by-step process

1. **Load the Film:** In complete darkness, load the film onto the reel and place it inside the developing tank. Seal the tank securely.
2. **Prepare the Fixer:** Mix your fixer according to the manufacturer's instructions, ensuring the fixer is at the recommended temperature (around 20°C or 68°F).
3. **Prepare the Developer:** Visit Digital Truth's DevChart to find the correct development time and dilution ratio for your specific film and developer combination. You'll also need to calculate how much developer is required. Refer to the "Tips" section for volume guidelines.

Example:

For Ilford HP5 (ISO 400) film and Adonal (same as Rodinal) developer:

- HP5 + Rodinal (1+25) = 6 minutes
- HP5 + Rodinal (1+50) = 11 minutes

4. We choose 1+25 for 6 minutes. For one roll of 35mm film, you'll need 290ml of developer. Calculate the concentrate needed:

$290\text{ml} / 25 = 11.6\text{ml}$.

Mix 11.6ml of developer concentrate with water at 20°C (68°F) to make 290ml.

Tore them in archival sleeves.

5. Developing:

- Pour the developer into the tank, start the timer, and agitate continuously for the first 30 seconds.
- Afterward, agitate for 5-10 seconds every minute for the recommended time.
- Once time is up, pour out the developer immediately.

6. Stop Bath:

- Pour in the stop bath (usually water, though a dedicated solution can be used) and agitate for 30 seconds to 1 minute.
- Pour out the stop solution when the time is up.

7. Fixing:

- Pour in the fixer and agitate for the first 30 seconds. Then, agitate for 5 seconds every minute. Fixer time is typically 4-10 minutes depending on the brand.
- Once the time is up, pour out the fixer.

8. Washing:

Rinse the film with running water for about 5-10 minutes to remove any remaining chemicals. A hypo-clearing agent can speed this up.

9. Wetting Agent (Optional):

- Add a few drops of wetting agent to the rinse water. A one-minute rinse in this solution helps prevent water spots during drying.
- Discard the solution after 1 minute.

10. Drying:

Hang the film using clips in a dust-free area and let it dry completely (usually takes 1-2 hours).

11. Digitize or Darkroom Print:

Once developed and dried, digitize the negatives using a scanner or print them in a darkroom.

Cutting and Storing: Cut the film into strips of 4-6 frames and st

Tips

Volume Needed:

- Hand-developing in a Paterson tank requires 290ml per 35mm film and 500ml per 120 film.
- For the AGO film processor, refer to the user manual for volume requirements.

Temperature Control:

While black-and-white development isn't as temperature-sensitive as color film, maintaining a stable 20°C (68°F) will produce consistent results.

Agitation Methods:

- **Constant Agitation:** Motorized units handle this automatically, ensuring even development.
- **Hand Agitation:** Use the inversion technique. Agitate continuously for the first 30 seconds, then perform four inversion cycles every 30 seconds. (One inversion = turning the tank upside down and back.)

Constant Agitation:

When using a rotary processor (e.g., AGO), reduce development time by 15%.

Fresh Chemicals:

Black-and-white chemicals have a longer shelf life than C-41 chemicals. To check if they are still good, dip small pieces of film into the developer and fixer. Film in the developer should turn black, while film in the fixer should become transparent.

Chemical Reuse:

Fixer can be reused for multiple rolls, but developer is usually one-shot and should be discarded after use.

Troubleshooting

- **Underdeveloped Film:** May occur due to incorrect temperature or insufficient development time. Ensure chemicals are fresh and that timing is accurate.
- **Overdeveloped Film:** Often caused by excessive development time or high temperatures. Double-check your chemical temperature and timing.
- **Streaks or Spots:** Usually due to improper washing or drying. Make sure the film is thoroughly rinsed and dried in a dust-free environment.

Conclusion

Developing black-and-white film at home is a rewarding and creative process. By following these steps and paying close attention to temperature, timing, and agitation, you can create beautiful, high-quality negatives.

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