

SCALA, THE B&W REVERSAL KIT

TIMES & DILUTIONS

HOW FILM REVERSAL WORKS

Combined with ADOX SCALA film, this process produces high quality, sharp, fine-grain black-and-white slides with an extended dynamic range.

The film's exposed silver halides are converted to metallic silver by the first developer. In normal processing, the unexposed silver halides are removed with fixer, leaving a negative image. In order to get a positive, the metallic silver is dissolved by a special silver solvent (bleach). What remains is the unexposed silver halides that are still sensitive to light. After re-exposure, they form a perfect opposite of the initial negative, which then is developed again, producing a rich and brilliant slide.

PROCESSING TECHNIQUE

AGITATION

Agitation of developers and clear bath uses the same technique: continuous agitation for the first minute, then 10 seconds of agitation per minute (or 5 seconds every half minute) for the remaining time. Bleaching is best with mild and continuous agitation.

WASHING

Water temperature should be kept at 20°C/68°F with a tolerance of 2°C/3.6°F, and can be slightly higher for Scala 160. Washing time under running water should be no less than 3 minutes, with fully emptying and refilling the tank at least twice. If washing is done by the fill and dump method, 8 fills with 30 seconds agitation ensure proper removal of previous chemistry.

CAPACITY

One SCALA kit can be used for processing up to eight 35mm or 120 rolls of film, depending on your tank.

Processing two rolls at a time is possible only if the films are the same (SCALA 50 and SCALA 160 cannot be processed together due to different times). With 120 format, two films can safely go on one reel and be processed as normal in 500ml/16.9Oz of chemistry.

The kit is designed to be easy to mix. Developer, Bleach and Clear make 2 liters (67.6 Oz) of working solution each. Developer and Bleach are to be diluted 1+1 (equal parts of liquid concentrate and water), and Clear powder is to be mixed in 2 liters of water.

Bath	Dilution	To make	Water	Stock Solution
First Developer & Bleach	1+1	250 ml 300 ml 500 ml	125 ml 150 ml 250 ml	125 ml 150 ml 250 ml
Clear Bath		For two liters (67.6 Oz) of working solution: Put an entire Clear Bath bag in 1 liter (33.8 Oz) of 20°C/68°F-24°C/75°F water and stir until dissolved. Add water until it reaches 2L. For one liter (33.8 Oz) of working solution: Put half of the Clear Bath bag (50gr) in 500 ml (16.9 Oz) of water and stir until dissolved. Add remaining water.		
Second Developer		Re-use the First Developer for this step!		

BATH	SCALA 50 (20°C/68°F)	SCALA 160 (24°C/75°F)
First Developer	14 min	9 min
Rinse	2:30 min	2:30 min
Bleach	4 min	6 min
Rinse	2:30 min	2:30 min
Clear	4 min	4 min
Rinse	3 min	3 min
Re-Exposure	2 min each side	2 min each side
Second Developer	6 min	6 min
Final Wash	6-10 min	6-10 min

REVERSAL PROCESSING STEPS

1. FIRST DEVELOPER

Time and temperature are extremely influential during this step. Longer development leads to washed-out slides. It is important to tap the tank gently on the work surface to get rid of air bubbles during agitation.

After first development, the developer should be poured into a bottle/cylinder and saved to be reused in step 5.

The film has to be thoroughly washed after this step to stop the development. The difference in PH between the two steps is such, that **short rinsing may lead to emulsion's lift-off** during bleach bath, because photographic films are incapable of tolerating great shifts in acidity levels.

2. BLEACH BATH

To ensure proper bleaching, the tank is best to be slowly continuously agitated the entire time.

Too violent agitation may lead to over-bleached film, therefore brighter and harsher slides. Proper washing is necessary to remove all residual bleach from both the film and the tank.

3. CLEAR BATH

The clearing bath removes the yellow staining created during the bleach bath. After this step, the film should be washed again to be prepared for the second exposure.

NOW YOU CAN OPEN THE TANK!

4. SECOND EXPOSURE

It is very important to ensure a completely even exposure of the film. Best results are achieved under a 100-150W incandescent lamp at a 45-80cm (18-31in) distance. Alternatively, a fluorescent lamp at 30-40cm (12-15in) can be used too.

Do not expose to direct sunlight!

It's best if the film roll is in a transparent water-filled cylinder, but an open tank with water works too. The tank/cylinder can be slowly rotated and slightly tilted under the light. After two minutes of exposure, the film side should be changed by placing the reel upside down, and exposed for the remaining two minutes. Overexposure may lead to film staining.

Two 35mm films, when processed in the same tank, have to be exposed one after the other. 120 film should be exposed in a water-filled transparent cylinder to ensure good lighting across the film's bigger surface.

5. SECOND DEVELOPER

The first developer is used again as the second developer. The process is exactly the same except for a difference in time. The developer has to be discarded after this step. Now the slides are fully developed!

6. FIXER (OPTIONAL)

To remove possible residual silver halides, it is recommended to use any general use fixers. Rapid fixers should be used at their weakest dilution (not 1+4, but 1+9) for no longer than 4 minutes, otherwise the emulsion's lift-off risks increase considerably.

7. FINAL STEPS

After fixing, the slide can be treated like normal negative film: a final long wash, followed by Adostab for archival purposes or an Adoflo wetting agent.

OTHER PROCESSING NOTES

CONTRAST CONTROL

It is possible to manage contrast within limits with the Scala kit, e.g., if the light is very flat, 15 minutes of first developer for Scala 50 will create nicer highlights.

ROTARY PROCESSING

For Jobo rotary processors, the times of the two developers should be decreased by 15%. Bleach and clear stay same.

EMULSION LIFT-OFF

In 8 out of 10 cases, it is caused by insufficient washing between the processing steps. The remaining causes are either very big temperature shifts, or local tap water (the latter being quite rare, but still distilled water is recommended for mixing). Small edge lift-offs can be a result of poor handling - after going through so many PH shifts and baths, the emulsion is more delicate, so it should be washed in cool water, carefully taken out of the reel and not touched until dry.

OTHER FILMS

This kit was designed to give the best results with ADOX SCALA films. However, any b&w film can be reversal-processed. It will likely not look as stunning and brilliant, because most modern films have a non-transparent base.

Old Agfa SCALA films have shown good results in this kit, however, as those films are expired, the outcomes vary depending on storage conditions.

A good starting time is close to SCALA 50. Nice results were obtained with 13 min first developer, 5,5 min bleach with constant agitation, same times for Clear and Second Developer. We are posting development times for other film in our [instagram.com/adoxphoto](https://www.instagram.com/adoxphoto) SCALA highlights, as we get more feedback from the community.

If you are planning to experiment, keep in mind that most films don't enjoy 24°C/75°F - SCALA 160 is unusually resistant. And Clear and Second Developer don't have a major effect on the results, so times can be kept same.

STORAGE AND FUTURE LIFE

STORAGE

When stored in regular closed bottles at lower room temperatures in subdued light, diluted bleach and clear baths from a recent production last for 8 weeks, stock (undiluted) solutions last for 16 weeks after opening. Stock developer lasts 4 weeks after opening.

When protected from contact with air (e.g., with protective gas), stock developer lasts for 24 weeks, stock bleach and clear baths last for 48 weeks, and diluted bleach and clear bath last for 12 weeks.

The more time passes after the production date, which can be found on the bottle, the shorter storage time can be expected.

RE-USE

It is not recommended to re-use the solutions for yet another processing session. However, the developer, especially from a recent production, even after being used twice, remains quite strong, and can be saved and used as a paper developer for a printing session.

The bleach, after being used, is not strong enough to bleach another film, but it is excellent for removing developer stains from darkroom trays.

MORE INFORMATION

The video of the entire process can be found on [youtube.com/adoxphoto](https://www.youtube.com/adoxphoto) and [instagram.com/adoxphoto](https://www.instagram.com/adoxphoto) IGTV.

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