

Contrast and density reduction of overdeveloped negatives

If a negative is too dense and too contrasty due to overdevelopment and it is unsuitable for tonal reproduction in the silver positive process, various reduction methods are available.

One common method is density reduction in the Farmer's reducer. This method has a decisive disadvantage: what's gone, is gone!

A safer method, because it is controllable and can be repeated if the attempt fails, is bleaching with subsequent re-development. In bleaching, the well-washed negative is bathed in a solution of oxidising agents and halides, whereby the metallic silver is converted back into a silver salt (silver bromide or silver chloride). Bleaching should be done in subdued light, then rinse until the yellowish tint disappears.

Afterwards the negative is exposed to light for a short time (daylight or light box) and developed again, or (for the time being - see example picture 2) not.

The following chemicals are suitable as oxidising agents for the bleach solution:

Potassium dichromate, potassium hexacyanoferrate, potassium permanganate and copper sulphate.

Chromates are toxic! Nevertheless, I prefer the chromate formulation below because it is safe to use and lasts for years. Chromates may no longer be passed on to end consumers.

Bleaches according to Eder:

Water 40 - 50°C	750			750	750			
Potassium dichromate	10	gr	Potassium permanganate	5	gr	Copper sulfate	50	gr
Potassium alumin sulfate	50	gr	Sodium chloride	13	gr	Sodium chloride	50	gr
Hydrochloric acid conc.	30	ml	Acetic acid 98%	50	ml			
Water to	1000	ml		1000	ml		1000	ml

Hexacyanoferrate/bromide bleaches are also suitable, more readily available and harmless to health. Although in my view silver chloride is preferable because of the finer grain, here is a Du Pont recipe for conversion to silver bromide.

Water	900	ml
Potassium ferricyanide	13,7	gr
Potassium bromide	27,5	gr
Ammonia conc.	1,3	ml
Water to	1000	ml

In all the solutions listed, the negatives remain until the blackening disappears completely and the image appears white. Any fine-grain developer can be used for redevelopment, for example Kodak D23 1+3, or Ilford Perceptol, or MZB as a single bath 1+2+6, or as a two-bath A 1+3, B 1+1. Two-bath development with separate developer and alkali solution has the advantage of recovering the original shadow densities and only reducing the highlight densities.

The development can be interrupted at any time (stop bath) to judge the negative density on a light box. Once the desired density and optimal negative contrast has been achieved, the unreduced silver salt should be removed by a short fixage. Before this, make a test print and critically assess whether the contrast is sufficient and the negative has been developed without streaks. If the contrast is still too low, simply develop to a higher density. If the negative has been developed for too long or if streaks have appeared as a result of a too short development time or insufficient agitation, bleach again.



Left original negative: 1.69 logD much too high, printed with grade 0

Right bleached and developed too short: 0.45 logD much too low printed with grade 5



Developed longer in MZB to 1.15 logD,
printed on grade 2.3