

DiXACTOL® single or two bath film developer — instructions for use

DiXACTOL® is a unique developer of special interest to artists and photographers producing monochrome fine prints, yet it is also uniquely tolerant and easy to use. It has four main distinguishing characteristics. It produces the fullest palette of richly graduated tones, especially in the holding of translucent and delicately drawn highlights particularly resistant to "blocking up" at high exposure levels. At the same time, shadow detail and separation is nursed up to unusual levels. Printing is likely to need significantly less burning in, in landscape skies for instance, and graduation is likely to be markedly superior in these burned-in areas. Discriminating workers appreciating the fine separation of tones should find this a satisfying developer. Secondly, the sharpness of images produced is remarkable with outstanding acutance. The maker believes this to be the sharpest developer of any commercially available solution. Thirdly, unlike normal high definition developers, the grain appears as fine as standard developers due to a special grain masking effect. (Photographers requiring the finest grain of any developer at a slight expense of acutance compared to **DiXACTOL®** should use DiLuxol©).

Finally, all films (with the exception of adapted document copying films and ultra high speed films) can be developed together in the two bath option, regardless of film speed or make, for about the same time, and with great tolerance of exposure and processing temperature, to produce printable negatives. The maker believes the tolerance to be superior to any other make or type of developer, and it makes the simultaneous processing of roll films containing many different pictures with greatly varying subject brightness ranges practical. Photographers using zone system exposure control on roll film should find it possible to give a single processing time that allows higher quality printing on a narrower spread of paper contrast grades. N+ or N- development times are still perfectly possible for those zone system workers wishing to exercise tight control of tonal contrast, but the need for this is much reduced. For ultimate control of negative density for individual film emulsions, and for even greater solution economy, single bath processing is available, and the 'spread' of suggested development times for varying films is narrower than conventional developers. This means developing differing film emulsions together for the same time is frequently a practical proposition. Single bath development gives slightly greater sharpness and stain masking too.

DiXACTOL® achieves this by a different approach and unique formulation. It is the only commercially available solution to combine conventional two-bath development, which in itself holds back the over-development of negative highlights while it builds up shadow detail, with tanning, staining, and ultra high definition developing agents. The tanning of the gelatine containing the film emulsion occurs in direct proportion to the varying exposure received by differing areas of the negative - the more the exposure, the more the tanning. This tanning inhibits the ingress of developer to the emulsion. Therefore heavily exposed highlight regions of the negative are restrained in development while development continues in the lesser-exposed shadow areas. The tanning also helps prevent the softening of definition common with fine grain development and helps resist emulsion abrasion. Along with the use of the sharpest known developing agent at high dilution to form boundary effects, the result is outstandingly high definition. Halation around heavily exposed areas of images (such as windows in an architectural interior, or lights in a night-time picture) is also especially well controlled.

The natural oxidization of the solution absorbed into the emulsion in the first bath during activation in the second bath (or simultaneously with development in the single bath option) causes a further vitally important effect - a brown stain with hints of yellow/green in proportion to the level of exposure in each area of the negative. The emulsion of both graded and variable contrast papers is largely "blind" to this colour, as in a safelight, and it acts as printing density. The result is that the negative needs less actual development of the silver, so the grain is lessened even further and definition further enhanced. A **DiXACTOL®** negative will look thin to the human eye, but will print with far more body than would seem likely because of the printing density of the stain. The stain in some tanning developers can be markedly yellow/green, and varies greatly among various film types giving inconsistent printing characteristics. The yellow/green colour also affects variable contrast papers by softening their contrast. Sometimes this is a useful characteristic, but often it isn't, giving unpleasantly distorted tonal rendering. The colour produced by **DiXACTOL®** is much more consistent across film types, and gives predictable tonal distribution on graded and variable contrast papers. The effect of the stain differs, however, when printing on these different types of paper. On graded paper the stain acts purely as extra printing density thus making the negative more contrasty than visual inspection might suggest.

On VC papers the stain also acts to soften contrast slightly. Since the stain is greater in the highlights than the shadows, this means that there is an automatic softening of highlights while shadow contrast is relatively unaffected. This can be very useful in the automatic 'masking' of highlights with a tendency to block up, such as windows in architectural interiors or clouds in landscapes. Users will find an approximate difference of one grade between the same negative printed on graded and VC papers.

Furthermore, the stain occurs in the gelatine between the clumped grains of silver in the negative which are actually quite prominent in this high definition developer. Since the stain acts as printing density, the effect is at least to partially fill the spaces between the grain clumps when printing. The result is a smoothness of tonality that renders delicate highlights such as mist with a new level of almost 'liquid' reality usually spoiled by the grain of conventional developers.

This combination of characteristics, unobtainable in any other solution, renders the developer especially applicable to the recently evolved monochrome negative films with special grain structures. Some of these, while capable of

previously unobtainable quality levels, require expert control of exposure and development - a difficult challenge with roll films - if problems like empty shadows and bald highlights are to be avoided, and the fine grain and tonal rendering of which they are capable is to be realised. **DiXACTOL**® is blended to maximise results from these emulsions. Many of these new film emulsions, while having high resolution, do not have the emphasised acutance of more traditional films. They tend not to look as sharp. **DiXACTOL**® gives a level of crispness previously unknown. Simultaneously, the high definition of traditional old favourite emulsions is even further enhanced without the usual price in grain prominence. Both types of emulsion can be processed together without concern.

CAUTION

Keep photographic chemicals out of reach of unsupervised children. Bath A contains Catechol and Glycin; Bath B contains a caustic solution. With both baths avoid contact with eyes and skin. Harmful by inhalation or if swallowed. In case of contact with the eyes, rinse with plenty of clean water and seek immediate medical advice. In case of ingestion seek urgent medical advice. The solution can stain. Take care to protect skin, clothing and surfaces. **This developer is sensitive to agitation technique. You are cautioned to test the two bath version carefully with your water supply and technique before committing important films to this developer. If in doubt, use the single bath option. It is also very sensitive to contaminated processing equipment. If in doubt, about processing reels especially, use new ones to avoid negative staining or streaking.**

MIXING

DiXACTOL® is supplied in two 250ml bottles of concentrate marked 'A' and 'B' respectively. These are diluted to various degrees as instructed later to make working solutions.

WORKING LIFE AND CAPACITY

The developer has an exceptional working life. The use of an inert gas spray in the 'A' bottle after each use before recapping will prolong it even further. Concentrate A is a pale pink when fresh, and discolours to a distinct and pinky green hue when deteriorating. Concentrate B is clear when fresh. The life of the concentrate 'A' should be not less than 6 months in reasonably cool conditions. Concentrate B does not deteriorate in storage to all intents and purposes. The capacity varies according to dilution up to 49 rolls of 36 exposure 35mm film or more. The developer has the unusual advantage in two bath option of being one shot, almost. Each bath is made up of 1 part of stock solution to 19 parts of water and discarded after use, *but* at least a further two films can be processed in each such diluted amount using the same development times if used within four hours before disposal of this diluted solution. Four hours is a conservative guide. In single bath option, it is one shot. Do not reuse the working solution after processing the first film(s) - see below for dilution rates.

EXPOSURE

Expose at or just below the film maker's rated speed (example EI 320 for EI 400). Because of the added printing density of the stain, the usual cut in speed needed for fine negatives with proper shadow detail for fine prints is unnecessary. Negatives given generous exposure will, however, resist blocking in the highlights while opening up shadows when developed in **DiXACTOL**®. For finest quality prints, carry out simple tests for true film speed with your equipment and expose using zone system principles to place the areas you want to show full textured shadow detail on zone III.

DEVELOPING — TWO BATH

This is carried out at 21°C in small tanks. Anywhere between 20°C and 23°C is adequate with minor alteration of times. Both baths are made up on a one shot basis by diluting the stock solution 1:19 with water into two separate vessels (e.g. 15ml of stock solution to 285ml of water to make 300ml of working solution, or 25ml to 475ml of water to make 500ml). It is particularly easy to achieve the correct temperature with such high dilution by adding water from a bulk supply premixed in a clean container to the correct temperature. The developer is very tolerant, and a °C either way will make no discernible difference.

It is very important not to allow any of Bath B to get into Bath A in stock or diluted solution form. Take care with splashes, or, for instance, when using a thermometer in each bath, or to use the correct cap on each bottle. All films take the same time regardless of make or speed (except very slow technical copying or ortho films being used for continuous tone work for which photographers would have to experiment). It is recommended that 5 minutes in each bath is given for a trial film. Results from this should be well printable, but the time can be fine tuned between approximately 3½ and 6½ minutes in each bath to achieve the kind of negatives that print on your preferred "normal" grade of paper with your enlarging equipment. Obviously you should not process an important film until you have carried out trials of this kind. Stop and fix are normal, but ensure that the acid stop bath is not over strength- an acid processing environment reduces the desirable negative stain effect. Before development, give the film a presoak in water at the correct temperature. If air temperature is greatly different, 2 or 3 changes of presoak can be given, each of about 1 minute, which will help stabilise the tank temperature at that of the solutions. The presoak aids even absorption of the developer to avoid air bells. Pour off the presoak, which will also remove any anti halation dyes in 120/220 size films.

Pour in Bath A. Agitate once by inversion, then rap the tank base on a firm surface to dislodge air bells from the film's surface. Continue gentle inversion agitation with a twisting action, and not too violently which could cause frothing, for the first 30 seconds. Again rap the tank base. Agitate thereafter once every 30 seconds until Bath A time

is completed. Drain off the developer thoroughly and store if you intend to reuse. Do not use a stop bath, or even a water rinse, at this stage. Pour in Bath B. Agitate once and tap the tank base as above to dislodge air bells, but do not keep agitating in this bath for the first 30 seconds. Agitate gently giving an inversion with a twisting action every 30 seconds thereafter until the required time is complete. Pour off Bath B at the end of its time. Store for reuse -this is important. Please note that it is normal for the Bath B to be a strong brown colour on pouring it from the tank. Indeed, if it is not brown, it is a cause for concern since its necessary oxidation staining effect will not be acting without such discoloration. Now use stop bath and fix in the usual way. After fixing give a quick clean water rinse to wash away extraneous surface drops and traces of fixer from the film. Now without delay pour back Bath B agitating at 30 second intervals for about 2 minutes. This step is important in activating the chemical reaction causing the stain of the negative image which adds printing density. A slight difference in the colour of Bath B before and after this step should be visible. Pour off Bath B and store if you wish to develop further films in this solution. Wash and dry in the normal way. A minimum 20 minute immersion in the wash also aids the stain formation. This will not be great to the eye, but can be significant in printing terms. The best way to wash is to fill the tank with water at the same temperature as the processing solutions (from the same bulk supply used to mix the solutions), agitate briefly to remove air bells. After about 3 minutes pour off the water completely, refill with fresh water and re-agitate. Repeat the cycle at least 6 times. Making the wash slightly alkaline with a tiny amount of fully dissolved sodium carbonate, sodium metaborate, or borax further enhances tanning and staining, and can aid wash efficiency, but is a *very* minor refinement. Give a penultimate rinse in pure water, which can be de-ionised or distilled, if you use the alkaline solution, or if your mains supply is questionable in any way. After a final rinse in similarly pure water with wetting agent (leave immersed for not less than 30 seconds) the film can be hung to dry, squeegeed or not to choice, in a dust free atmosphere.

DEVELOPING — SINGLE BATH

This is carried in small tanks at 21°C. A presoak at the correct temperature tempers the tank and aids even development. Dilute 1ml of concentrate A with 300ml of water (or pro rata for other tank capacities. A medical syringe obtainable cheaply from any pharmacist aids measuring small volumes). Just before pouring this into the tank, add 7ml of concentrate B (or pro rata for other tank capacities). The solution will begin to change colour immediately. Pour into the tank without delay. Agitate for the first 30 seconds continuously using the inversion/twist technique described above; then at 30 second intervals thereafter.

Pour off the developer at the end of the time, but retain it for further use. Stop and fix in the normal way ensuring that the stop bath is not too strongly acid. After fixing, wash off any surface fixer drops with a quick clean water rinse, then pour back in the used developer for about two minutes with agitation at about 30 second intervals. Discard this used developer and wash and dry as described in the two bath section above. Development times for all films are approximately the same (other than for ultra slow adapted copying films, or ultra fast low light films). **Fine tune these times to suit your equipment and technique.** For printing on graded paper use a normal time of about 8 minutes; for VC paper use 10 minutes. For high subject brightness ranges cut by about 20%; for low, increase by 25%. Zone system workers should conduct their own usual film speed and development time tests.

PUSH PROCESSING

Push processing is not recommended for normal use but on occasions where extra film speed is vital at the expense of increased grain and contrast DiLuxol Vitesse© with its contrast limitation, ultra fine grain, and high inherent speed is much more suitable.

N -AND N + PROCESSING, TWO BATH

Fine photographers working with the Zone System who wish to control the contrast of their negatives during two bath processing to match their exposure for either low or high subject brightness ranges can do so. However, time is not a good control since the developing agents contained in Bath A which are saturated into the emulsion are virtually used to exhaustion during the immersion in Bath B. Therefore extension of time does not work well. Reducing times conversely leads to inconveniently short duration and the risk of unevenness. The best method is to vary the dilution while retaining the N time you have found to be right for your equipment. You should conduct new tests. For N - conduct trials at 1:24 dilution for both baths. For N + 1, start trials at 1:9 dilution for Bath A, and 1:14 Bath B. **Note: do not use Bath B stronger than 1:14 or streaking, fogging, and negative unevenness is very likely.**

LIABILITY

No liability is accepted by the maker and/or supplier of this developer other than for the value of the developer itself if faulty. No liability can be accepted for any consequential loss or injury. The maker/supplier will be pleased to refund the purchase price including carriage of this product even if the outer packaging has been opened if you do not wish to accept this condition provided that the bottles are returned to the maker/supplier unopened within 14 days of purchase. Only open one or both of the bottles if you accept this condition. You are strongly advised to conduct your own tests before committing valuable films to this developer.