

FACT SHEET

ID-11**A POWDER FILM DEVELOPER AND REPLENISHER FOR THE HIGH VOLUME BLACK AND WHITE FILM PROCESSING IN DEEP TANKS AND DIP & DUNK (HANGER) PROCESSORS**

ILFORD ID-11 is an economic, versatile, powder developer and replenisher system for processing large volumes of all general purpose black and white films in deep tanks and dip and dunk (hanger) processors. It is not recommended for use with continuous long leader or roller transport or short leader card processors.

ID-11 is a fine grain film developer for all general film processing requirements where fine grain negatives are required without loss of emulsion speed. It is recognised internationally as a standard in many fields of scientific and technical photography.

ID-11 produces excellent results with all films and is ideal where a wide range of films and film speeds have been used. It ensures the best balance of fine grain, sharpness and tonal rendition producing negatives which allow a high degree of enlargement.

Information about using ID-11 in dishes/trays, small tanks and rotary tube processors is available in a separate fact sheet.

To use ID-11 developer the powder is dissolved in water to make a stock solution. Do not use ID-11 developer as replenisher.

For replenished processing applications ID-11 developer is used in conjunction with a separate ID-11 replenisher. To use ID-11 replenisher the powder is dissolved in water to make a stock solution. Do not use ID-11 replenisher as developer.

A well managed replenished ID-11 developer will reliably produce high quality, sharp fine grain negatives. The recommended operating temperature range is 20–24°C (68–75°F).

MIXING

Note Photographic chemicals are not hazardous when used correctly. It is recommended that gloves, eye protection and an apron or overall are worn when handling and mixing all chemicals. Always follow the specific health and safety recommendations on the chemical packaging. Photochemical material safety data sheets containing full details for the safe handling, disposal and transportation of ILFORD chemicals are available from ILFORD agents or directly from the ILFORD web site at **www.ilford.com**.

Preparing stock developer

ID-11 developer packs contain two parts, A and B. Always make up the developer stock solution to the volume stated on the pack, do not attempt to prepare smaller solution quantities by using fractional parts of each powder. However, larger stock solution quantities can be prepared by using multiples of whole packs.

Before mixing fresh batches of ID-11 developer and replenisher ensure that the developer and replenisher tanks, connecting solution lines and any mixing vessels are thoroughly rinsed and cleaned, particularly if it is being used for the first time. When making solutions ensure that the mixing vessel is large enough for the volume of solution to be mixed and stirred.

To prepare stock developer, dissolve the contents of part A (the smaller bag) in about three-quarters of the total solution volume (see carton) of warm water at about 40°C/104°F. Stir until most of the part A powder has dissolved, continue to stir while gradually adding the contents of Part B (the larger bag). Keep stirring until no more powder dissolves. NB, it is normal for a few grains of powder to remain undissolved. Add cold water to make up to the final volume (see carton) and stir. Allow to cool to working temperature, 20–24°C (68–72°F).

As most water drawn from pressure mains is highly aerated, we advise that users draw off the water they need and leave it to stand for a few minutes before using it to make up developers.

For deep tanks and dip and dunk (hanger) processors the stock solution is used as the working strength developer. Do not dilute further for use.

After filling a processor with any fresh tank solution, switch it on and allow it to get up to temperature and circulate the solutions. After the working temperature is reached leave it recirculating for at least 10 minutes to ensure the fresh chemicals are thoroughly mixed before attempting to process any film. Always replace the tank covers used on the process and replenishment solutions. The processor is now ready to use.

Preparing stock replenisher

The method of mixing is the same as that used for making the stock developer solution.

The stock solution is used as the working strength replenisher does not dilute further for use.

Wash all mixing vessels and utensils thoroughly after use.

pH and specific gravity

The following table gives the pH and specific gravity (SG) for fresh, ID-11 developer and ID-11 replenisher stock solutions. These figures were obtained under carefully controlled laboratory conditions and may differ slightly from measurements made by users in their own working areas. Users should make their own control measurements from their own accurately mixed fresh solutions for later comparison. Ideally a pH meter should be used to measure solution pH but if one is not available pH measurement sticks can be used. These are available in various pH ranges and those covering a range from pH 7 to pH 10 are sufficient. SG can be measured by using a hydrometer and one covering the range from 1.000 to 1.200 is useful for a wide range of photographic process solutions.

| stock | pH | SG at 20°C |
|-------------------|-----------|------------|
| ID-11 developer | 8.60–8.70 | 1.095 |
| ID-11 replenisher | 8.93–9.03 | 1.100 |

PROCESS SYSTEMS

Deep tank processing

Stock ID-11 developer can be used in deep tanks at the recommended process temperature of 20°C (68°F). However, it can be used in the temperature range of 20–24°C (68–72°F) but the development times must be reduced for the higher temperatures. Care must be taken with the choice of dilution and temperature as very short development times may lead to uneven processing.

Check the temperatures of all the process solutions and if necessary adjust them to be +/- 1°C (2°F) of the temperature being used.

Manual agitation for deep tanks

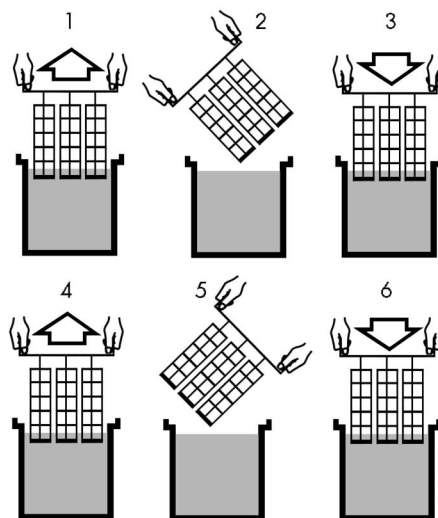
The following method of manual agitation is recommended with ID-11 in deep tanks.

Lower the processing rack into the tank and tap the rack on the edges of the tank to remove any air bubbles. Lift the rack out of the solution and return it immediately. Tap the rack again on the edge of the tank.

At the end of each minute, lift the rack out of the solution, tilt it to one side and return it to the tank. Repeat this another two times, alternating the direction of the tilt. Tap the rack on the edge of the tank after the three lifts.

The same agitation technique should be used with the other process solutions.

Ten seconds before the end of each processing step lift the rack out of the solution and drain for the remainder of the time.



Alternatively gas agitation can be used, (see below), but it is not recommended when processing films on spirals.

Processors

Dip & Dunk processors

Replenished ID-11 developer can be used in dip & dunk (hanger) processors at the recommended process temperature of 22°C (72°F).

Gas burst agitation for Dip & Dunk processors and deep tanks

If gas burst agitation is in use then nitrogen must be used to agitate the developer whereas air can be used for the stop bath, fixer and wash. Do not use air to agitate the developer solution. To set up gas burst agitation follow the equipment manufacturer's instructions, if none are given then as a starting point set the gas pressure to 0.3–0.9 bar (5–14 psi) and the agitation cycle to 2 seconds gas on 8 seconds gas off.

Alternatively a lower rate of agitation can be used of one gas burst every other second for eleven seconds in each minute but development times may need to be adjusted.

Care must be taken when using gas agitation as uneven processing may result with some equipment. Do not load the films too closely together as this will reduce the effect of the agitation.

The same amount of agitation but with air can be used for the other process solutions.

Gas agitation of wetting agent solutions is not recommended as excessive foaming will occur.

DEVELOPMENT TIMES

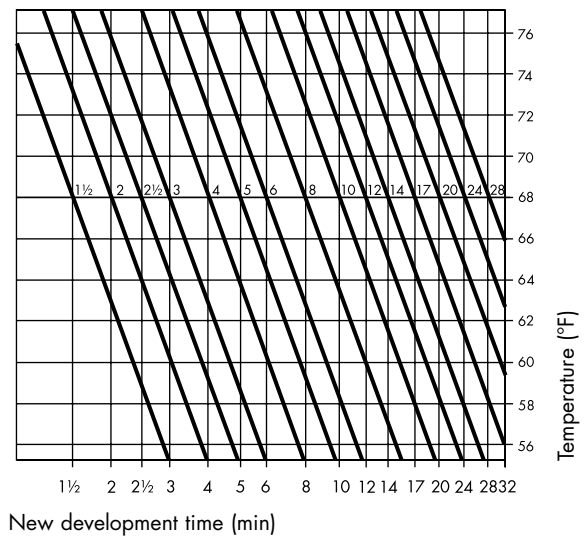
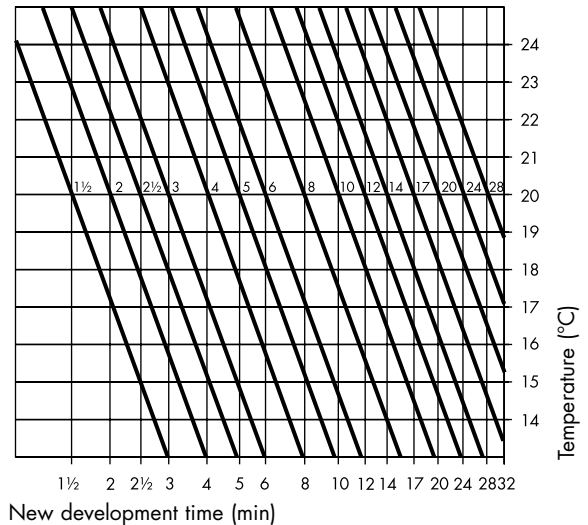
The table of development times given here gives an appropriate starting point for the ID-11 used for in deep tanks and dip and dunk (hanger) processing general purpose camera film.

The development times are for films rated at their nominal EI rating and should produce negatives of normal contrast, the aim is for a Gbar of 0.62. However they are only a guide and may need to be adjusted to suit individual processing systems, working practices and preferences. Higher or lower contrast negatives may be preferred by some to suit their individual requirements. Adjust the recommended development times until the desired contrast level is obtained.

ID-11 can be used in the temperature range of 20–24°C (68–72°F). For processing at other temperatures increase the given development times by 10% for each 1°C (2°F) drop in temperature and decrease the given development times by 10% for each 1°C (2°F) rise in temperature.

Alternatively development times can be calculated from the charts below.

For example, if 4 minutes at 20°C (68°F) is recommended, the time at 23°C (73°F) will be 3 minutes and the time at 16°C (61°F) will be 6 minutes.



In some processors the development time is controlled by the machine's speed. Please refer to the technical information of the machine's manufacturer to convert development time to machine speed.

ILFORD FILMS

| | Meter setting | Stock 20°C (68°F) | |
|----------------------------------|-------------------|---------------------|---------|
| | | minutes and seconds | seconds |
| 100 DELTA PROFESSIONAL | EI 50/18 | 7:00 | 420 |
| | EI 100/21 | 8:30 | 510 |
| | EI 200/24 | 10:30 | 630 |
| DELTA 400 PROFESSIONAL | EI 200/24 | 7:00 | 420 |
| | EI 400/27 | 9:30 | 570 |
| | EI 800/30 | 11:30 | 690 |
| | EI 1600/33 | 14:30 | 870 |
| | EI 3200/36 | 19:00 | 1140 |
| DELTA 3200 PROFESSIONAL | EI 400/27 | 7:00 | 420 |
| | EI 800/30 | 8:00 | 480 |
| | EI 1600/33 | 9:30 | 570 |
| | EI 3200/36 | 10:30 | 630 |
| | EI 6400 /39 | 13:00 | 780 |
| | EI 12500/42 | 17:00 | 1020 |
| PANF Plus | EI 25/15 | 6:30 | 390 |
| | EI 50/18 | 6:30 | 390 |
| FP4 Plus | EI 50/18 | 6:30 | 390 |
| | EI 125/22 | 8:30 | 510 |
| | EI 200 /24 | 10:00 | 600 |
| HP5 Plus | EI 400/27 | 7:30 | 450 |
| | EI 800/30 | 10:30 | 630 |
| | EI 1600/33 | 14:00 | 840 |
| | EI 3200/36 | 20:00 | 1200 |
| SFX 200 | EI 200/24 | 10:00 | 600 |
| | EI 400/28 | 14:00 | 840 |
| | EI 800/30 | 18:00 | 1080 |
| ORTHO PLUS Pictorial Contrast | EI 80/20 Daylight | | |
| | Normal | 8:00 | 480 |
| | High | 10:00 | 600 |
| | EI 40/17 Tungsten | | |
| | Normal | 8:00 | 480 |
| | High | 10:00 | 600 |

NON ILFORD FILMS

| | Meter setting | Stock 20°C (68°F) | Stock 20°C (68°F) |
|------------------|---------------|---------------------|-------------------|
| | | minutes and seconds | seconds |
| Kodak Tmax 100 | EI 100/21 | 8:00 | 480 |
| | EI 200/24 | – | – |
| Kodak Tmax 400 | EI 400/27 | 7:00 | 420 |
| | EI 800/30 | 9:30 | 570 |
| | EI 1600/33 | 12:00 | 720 |
| | EI 3200/36 | 15:00 | 900 |
| | EI 6400/39 | 18:00 | 1080 |
| Kodak Tmax 3200 | EI 400/27 | – | – |
| | EI 800/30 | – | – |
| | EI 1600/33 | 11:00 | 66 |
| | EI 3200/36 | 14:00 | 840 |
| | EI 6400/39 | – | – |
| Kodak Plus X | EI 125/22 | 7:00 | 420 |
| Kodak Tri X | EI 400/27 | 7:30 | 450 |
| | EI 800/30 | – | – |
| | EI 1600/33 | 12:00 | 720 |
| | EI 3200/36 | – | – |
| Agfa APX 100 | EI 100/21 | 9:00 | 540 |
| Agfa APX 400 | EI 400/27 | 10:00 | 600 |
| | EI 800/30 | – | – |
| | EI 1600/33 | – | – |
| | EI 3200/36 | – | – |
| Fuji 100 Acros | EI 100/21 | 6:45 | 405 |
| Fuji Neopan 400 | EI 400/27 | 7:30 | 450 |
| | EI 800/30 | 8:45 | 525 |
| | EI 1600/33 | 13:30 | 810 |
| | EI 3200/36 | – | – |
| Fuji Neopan 1600 | EI 400/27 | – | – |
| | EI 800/30 | 4:30 | 270 |
| | EI 1600/33 | 6:30 | 390 |
| | EI 3200/36 | – | – |

The development times for other manufacturers' films are a general guide. The specification of these products may have changed over time and as a result these development times may need to be adjusted. If necessary the given times should be adjusted to give the result required.

STOP, FIX, WASH and RINSE

For best results it is recommended that all process solutions are kept at the same temperature or at least within 5°C (9°F) of the developer temperature.

Stop Bath

After development it is recommended that films are rinsed in an acid stop bath such as ILFORD ILFOSTOP (with indicator dye) or ILFOSTOP PRO (without indicator dye). ILFOSTOP PRO is recommended for all machine processing applications. When tanks of process solutions are in use a stop bath immediately stops development and reduces carry over of excess developer into the fixer bath. This helps to maintain the activity and prolong the life of the fixer solution.

| ILFORD Stop Bath | ILFOSTOP | ILFOSTOP PRO |
|--|----------------------|----------------------|
| Dilution | 1+19 | 1+19 |
| Temperature range | 18–24°C (64–75°F) | 18–24°C (64–75°F) |
| Time (seconds) at 20°C (68°F) | 10 | 10 |
| Capacity films / litre (unreplenished) | 15 x 135-36 | 22 x 135-36 |

The process time given is the minimum required. Due to the configuration of some processing machines a longer stop bath time may be given automatically but this should not cause any process problems. The design of some processing machines means that a stop bath cannot be included, provided that the fixer activity is monitored and adequate fixer replenishment rates used there should be no process problems.

Fix

The recommended fixers, ILFORD RAPID FIXER and ILFORD HYPAM liquid fixers and ILFORD ILFOFIX II powder fixer, are non-hardening fixers.

| ILFORD Fixer | RAPID FIXER & HYPAM | ILFOFIX II |
|--|------------------------|----------------------|
| Dilution | 1+4 | stock |
| Temperature range | 18–24°C (64–75°F) | 18–24°C (64–75°F) |
| Time (mins) at 20°C (68°F) | 2–5 | 4–8 |
| Capacity films/litre (unreplenished) | 24 (135–36) | 24 (135–36) |

The fixing time given is the minimum required. Due to the configuration of some processing machines a longer fixing time may be given automatically but this should not cause any process problems. ILFORD ILFOFIX II is not recommended for machine processing applications.

Wash

When a non-hardening fixer has been used wash the films in running water for 5–10 minutes at temperature above 5°C (41°F). Ideally the water temperature should be within 5°C (9°F) of the process temperature being used.

Rinse

For a final rinse ILFORD ILFOTOL wetting agent is recommended as it helps films to dry evenly. Start by using 5ml per litre of rinse water (1+ 200), however the amount of ILFOTOL used may need some adjustment depending on the local water quality, the type of processor and drying method. Too little or too much wetting agent can lead to uneven drying.

FIX HARDENER

ILFORD RAPID FIXER and ILFORD ILFOFIX II must not be used with fix hardeners as they are not compatible with them. If a fix hardener is required then only ILFORD HYPAM fixer can be used. Add ILFORD HYPAM HARDENER to HYPAM to turn it into a hardening fixer

Generally for most applications modern camera films are sufficiently hardened at manufacture. Additional hardening from a fixer hardener is not usually needed or recommended for deep tanks, rotary processors, dip and dunk machines and short leader processors, unless the processing temperature is above 30°C, (86°F) or poor drying performance is being experienced. A fixer hardener may be needed when using roller transport film processors to minimise the risk of physical damage.

Using a fix hardener will require the recommended fix and wash times to be extended. Depending on the film and processing conditions the fix plus hardener time will be between 4 and 10 minutes and the subsequent wash time 10–20 minutes.

The amount of HYPAM HARDENER that can be added to the fixer is dependant on the film and process conditions used. In some processors the full amount of hardener cannot be used as the fix and wash times cannot be extended adequately. In these circumstances we recommend starting with the minimum amount of hardener to have some effect. This is around 3 - 6 mls of hardener per litre of working strength HYPAM used. This increases the film hardness slightly but has a negligible effect on the fix and wash efficiency. When fix and wash times are restricted the maximum amount of HYPAM HARDENER recommended is 10 - 20 mls of hardener per litre of working strength HYPAM used. This higher amount will give a definite increase to the hardness of the films processed and while fixing and washing efficiency are reduced the films will be adequately fixed and washed for most purposes.

When fix and wash times can be extended the maximum amount of HYPAM HARDENER needed to achieve fully hardened films is 1 part to 40 parts working strength HYPAM. i.e. 24 mls per litre.

REPLENISHMENT

For replenishment only use ID-11 replenisher do not use ID-11 developer as replenisher.

The optimum developer replenishment rate for a particular process system can be found by using a process control system. For your processor please refer to the machine manufacturer's technical information to calibrate it for replenishment.

The recommended replenishment rates for ID-11 replenisher is 162 mls/m² (15 mls/ft²).

The table below gives the amount of replenishment for a range of popular film formats

| Film Format x 10 | mls | US fluid oz |
|-----------------------------|------|-------------|
| 135-12 | 30 | 1 |
| 135-24 | 60 | 2 |
| 135-36 | 90 | 3 |
| 120 | 90 | 3 |
| 220 | 180 | 6 |
| 10.2 x 12.7 (4x5") | 22.5 | 3/4 |
| 12.7 x 17.8 cm (5 x 7") | 40 | 1 1/3 |
| 20.3 x 25.4 cm (8 x 10") | 90 | 3 |
| 6.5 x 9 cm | 10 | 1/3 |
| 9 x 12 cm | 20 | 2/3 |
| 10 x 15 cm | 30 | 1 |
| 13 x 18 cm | 40 | 1 1/3 |

To give adequate replenishment to deep tanks, it may be necessary to remove some of the used developer from the developing tank so that the appropriate amount of replenisher can be added. Remove more developer than the amount of replenisher to be added. Add the replenisher to the tank and stir thoroughly and top up the solution to the correct level using some of the removed developer.

DEEP TANK PROCESSING WITHOUT REPLENISHMENT

Stock ID-11 developer can be used in deep tanks without replenishment to process either a number of films individually or multiple films in batches. Each litre of unreplenished stock ID-11 developer in a deep tank has the capacity to process up to 10, 135-36 or 120 films. However, as each film or batch of films is processed it releases halides and other by products into the developer that act as a restrainer on the development of subsequent films. For this reason development times will need some adjustment after each successive film or batch of films. To calculate the adjustment a tally must be kept of the number of films processed in the developer solution.

If a series of individual films is being developed in 1 litre of stock ID-11, compensate for the loss of developer activity after developing the first film by increasing the development time 10% for each successive film, (see table below). This method of time adjustment is assuming that either the whole litre is used to develop each film or if only part of the developer is used then its used and unused parts are mixed together before subsequent films are processed.

| 1l stock ID-11 | N | N+ 10% | N+ 20% | N+ 30% | N+ 40% | N+ 90% |
|----------------|---|--------|--------|--------|--------|--------|
| | 1 | 2 | 3 | 4 | 5 | 10 |

N = standard development time

The developer should be discarded either when the theoretical capacity of the solution volume has been reached or the development times have become too long to be practical.

When larger quantities of ID-11 are in use increase the number of films that can be processed proportionally with the volume of stock developer, e.g. if 5 litres of stock ID-11 are being used then increase the development times by 10% after processing every batch of 5 films. When films are being processed in small batches the following table shows for some common deep tank sizes the number of films that can be processed in stock ID-11 before each 10% increase in development time.

| tank volume litres | N | N+ 10% | N+ 20% | N+ 30% | N+ 40% | N+ 90% |
|--------------------|------|--------|--------|--------|---------|---------|
| 5 | 1-5 | 6-10 | 11-15 | 16-20 | 21-25 | 46-50 |
| 13.5 | 1-13 | 14-27 | 28-40 | 41-54 | 55-68 | 122-135 |
| 25 | 1-25 | 26-50 | 51-75 | 76-100 | 101-125 | 230-250 |

N = standard development time

When batches containing a large number of films are processed or when the number of films in each successive batch varies the table above needs some interpretation. No matter how many films are in the first batch it will always receive the standard development time for the film (N). However, the number of films in the first batch will

dictate the development time correction for the next batch of films. Thereafter the running total of films already processed by the developer indicates the appropriate increase for the third, fourth, fifth batches, etc.

For example, if a 13.5 litre deep tank is in use and there are five batches of film to process consisting of the following number of films 21, 21, 10, 17 and 5. The table below gives the appropriate time correction for each batch.

| Batch | 1 | 2 | 3 | 4 | 5 |
|--|----|-------|-------|-------|-------|
| number of films | 21 | 21 | 10 | 17 | 5 |
| total of films in the previous batches | 0 | 21 | 42 | 52 | 69 |
| development time for each batch | N | N+10% | N+30% | N+30% | N+50% |

It is more inconsistent to reuse developer with time compensation than to use a developer and replenishment system. The time compensation can only be an approximation to cover a wide range of film and negative types. For example, if due to the subject matter the negatives are relatively clear when developed then little of the developing agents will have been used in processing them. At the other extreme if the negatives are well blackened after development then more developing agent will have been used. There is also the risk of miss counting the number of films that have been processed through a batch of developer. Using a replenished deep tank processing system is recommended as a better alternative to developer reuse as it eliminates or greatly reduces associated problems.

We do not recommend push processing using reused developer.

PROCESSING WITH REPLENISHED DEVELOPER

The effect of use on a replenished developer system

The reaction that takes place during film development releases by-products (halides) into the developer, uses up developing agents and changes the developer's pH. These combine to reduce the activity of the developer and without replenishment it would gradually cease to function adequately and eventually become exhausted.

Replenishment has two key functions. It replaces the active ingredients used during development and dilutes the by-products that have been formed.

A replenished developer is said to be fully "seasoned" when the addition of the replenisher compensates exactly for the new by-products produced by development. At this point the concentration of halides and active ingredients have reached an equilibrium or steady state.

It is maintaining this equilibrium that gives a machine developer performance consistency.

Provided that the developer is used regularly, replenishment continues and all other factors remain the same, i.e. the concentration of the active ingredients, the by-products, etc., then the developer should perform consistently for a long period of time.

Fresh versus seasoned developer and the function of the replenisher solution

A tank of freshly made working strength developer is usually more active than a tank of "seasoned" replenished developer. If the same process time is used in both cases then a small loss in film speed and contrast will be seen using the seasoned developer. The change in performance from fresh to seasoned is gradual with each film processed until the equilibrium point is reached.

In a replenished process system with separate developer and replenisher solutions, the replenisher is formulated to be more active than the developer. The addition of this more active solution minimises the performance difference between the fresh and seasoned condition.

The time taken to reach equilibrium from fresh depends on the developer and replenisher formula, tank size, the amount of film processed and their type and replenishment rate. When ID-11 developer is used with ID-11 replenisher and replenished at the recommended rate there will be a small difference in performance between fresh and seasoned developer at equilibrium. Typically the development times in developer at equilibrium will need to be around 15 % longer than the development times in fresh developer.

PROCESS CONTROL

To process film to a consistent standard, it is essential to use a method to monitor the condition and activity of the process solutions. Valuable aids ensuring consistent film processing quality are ILFORD FP4 Plus CONTROL STRIPS and the ILFORD FILM PROCESS CONTROL MANUAL (FPC manual).

FP4 Plus CONTROL STRIPS are supplied pre-exposed on to a 30.5m (100 ft) roll of 35mm film. Each strip consists of four density patches, Dmin, LD, HD and Dmax, when needed individual strips are cut from the roll for process monitoring.

The FPC manual contains information about process control methods and equipment and a fault finding and correction guide. It also contains useful tools such as process control charts and user data record sheets.

Process control method, aims and tolerances

FP4 Plus CONTROL STRIPS should be regularly processed at the development time usually used for FP4 Plus film. The frequency of processing control strips is for the user to decide based on your workload and work patterns but we suggest that at least one control strip is processed per working session. After processing measure the density of the patches using a calibrated transmission densitometer and record the results for Dmin, LD and HD-LD on a process control chart. A visual assessment of density cannot be relied upon.

Before starting process control it is important to ensure that the developer is at equilibrium and producing satisfactory negatives. If it is then process three FP4 Plus CONTROL STRIPS, measure and record the density patches on each one and calculate HD-LD. Average the results for Dmin, LD and HD-LD and use these results as your aim values for future measurements. The process is considered in control provided that the measurements from subsequent strips are within +/-0.06 units of the established aim values.

The following FP4 Plus CONTROL STRIP density patch values are typical for seasoned ID-11 in good condition. They are given only as a guide and are not absolute values that must be achieved, do not attempt to adjust your process to obtain identical values. The most important thing is that the quality of the negatives produced is satisfactory.

| Seasoned | |
|-----------------|------|
| Dmin | 0.35 |
| LD | 0.45 |
| HD-LD | 0.80 |

Dealing with process variations

Properly replenished ID-11 developer in regular use should have a long tank life. Any large process variations seen are most likely to be caused by an external change. If a sudden and significant process variation has occurred it is most important to identify the cause, so that the appropriate corrective action can be taken.

Identifying a problem

First, look for the obvious. The cause of the process change may be something visible such as low solution levels, blocked/leaking pipes, no recirculation, poor agitation, etc. Check the solution temperatures, SG and pH as well as gas pressure and recirculation. Run the processor with some test films and check that it triggers all the correct machine functions, e.g. agitation, replenishment, etc.

Check for any obvious sign of developer contamination e.g. cloudiness of the developer or an unusual odour.

Check the machine settings, e.g. temperatures, development times and replenishment rates as they may have been changed from normal.

Regaining control of the process

Once the cause of the problem has been found and corrected then some action will probably be needed to get the process back within limits. It might happen automatically, for example if the temperature has been returned to the correct setting. If the problem was caused by low replenishment then removing a few litres of developer and replacing it with replenisher may bring the process back in control. In the extreme case to get back inside the limits may need all of the developer solution replacing with fresh developer.

If the reason for poor performance is contamination of the developer by stop bath or fixer then remove all the developer, flush out pumps and pipes, clean the tank and change the solution filter before replacing with a fresh solution.

WORKING SOLUTION LIFE

The life of a solution in a replenished system is dependent on film throughput, replenishment rates, processing temperature and film types. In dip & dunk (hanger) correctly replenished ID-11 may last for quite a long time in the process tank. The only sure way of always knowing that the activity of the developer is adequate is to use a process control system. As a general guide replenished ID-11 developer should be replaced after 2–3 months in the process tank.

For deep tank processing replenished ID-11 developer should be replaced when the amount of replenisher used is equal to the original volume of developer in the processing tank. For example if using a replenished 15 litre deep tank replace the developer when 15 litres of replenisher has been added. Alternatively, if this is sooner, the developer should be discarded after 4 months in a deep tank with a floating lid or 1 month in a deep tank without a floating lid.

Below are the solution lives in months of ID-11 developer and ID-11 replenisher stock solutions stored in cool conditions 5–20°C (41–68°F).

6 months in full tightly capped bottles
1 month in half full tightly capped bottles
4 months in a deep tank with a floating lid
1 month in a deep tank without a floating lid.

STORAGE

Unopened packets of ID-11 developer and ID-11 replenisher powder stored in cool dry conditions, 5–20°C (41–68°F), will keep indefinitely. Once opened use completely to make up stock solutions.

AVAILABILITY AND CAPACITY

ID-11 developer is available in cartons of 1, 2.5, 5, 10 and 13.5 litres.

ID-11 replenisher is available in cartons of 2.5 litres.

A wide range of fact sheets is available which describe and give guidance on using ILFORD products. Some products in this fact sheet might not be available in your country.