FACT SHEET

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SUNDRY CHEMICALS FOR PROCESSING BLACK AND WHITE FILMS AND PAPERS

To complement the range of ILFORD developers and fixers for black and white film and paper processing there is a range of other chemicals that includes stop baths, a wetting agent, a hypo-clearing agent, an algaecide and a cleaning agent. This fact sheet gives information about how to use each of these products.

Health and safety information is always given on the packaging of each product and should always be read before using it. Some photographic chemicals are classified as hazardous and care must be taken in handling them but when used correctly, following the instructions and guidelines that are given, they can be used quite safely. 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. Keep all foodstuffs away from areas where photographic chemicals are being prepared and used. Store all photochemicals out of the reach of children and do not allow them to use photochemicals unsupervised.

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**.

To avoid problems due to cross-contamination of photochemicals that can lead to process problems always thoroughly wash all utensils, measuring and mixing vessels after use. When ever possible use dedicated equipment for making up developer solutions.

pH and specific gravity

In the text for each chemical there are tables that give their pH and specific gravity (SG). 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 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. 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.

ILFOSTOP

ILFORD ILFOSTOP is a low odour citric acid stop bath. After development we recommend that films and papers are rinsed in an acid stop bath to stop development immediately and neutralise the developer to help maintain the activity of the fixer bath.

ILFOSTOP contains an indicator dye that is pH sensitive and changes colour from yellow to purple as the stop bath becomes exhausted. It is specifically recommended for dish/tray processing of paper or deep tank processing of film. ILFOSTOP helps to maintain the activity and prolong the life of the fixer solution by reducing carry over of excess developer (alkaline) into the fixer bath (acidic). It is not recommended for machine processing applications as the short fix and wash times often used may leave a residual dye stain on films and prints. The longer wash times usually associated with dish/tray and tank processing minimise this risk.

Do not let developer become contaminated with a stop bath solution.

pH and specific gravity

	pH	SG at 20°C
ILFOSTOP concentrate	1.00	1.101–1.111

Mixing instructions and use

ILFOSTOP is a liquid concentrate mixed with water 1+19 for use.

Determine the amount of solution needed for the processing session. Make sure that it is enough to fill a dish/tray to a depth of about half full or to cover the films in a spiral tank completely or fill a deep tank. Measure out the appropriate amount of concentrate using the smallest measuring cylinder appropriate to the liquid volume: it is easier to measure 100ml of solution in a 100ml cylinder than a 1000ml cylinder.

Add the concentrate to the mixing vessel. A large measuring jug is a good mixing vessel as it provides a check on the total quantity of solution mixed. Using an appropriately sized measuring cylinder, measure out the required dilution water using hot and cold water to get to the solution's working temperature, 20°C/68°F. Use some of this water to rinse out the measuring cylinder used for the concentrate into the mixing vessel. Finally add the remainder of the dilution water to make up to the final working volume and stir the solution thoroughly. The stop bath is then ready to use.

	ILFOSTOP
Dilution	1+19
Temperature range	18–24 °C (64–75°F)
Time for film and paper 20°C (68°F)	10 seconds
Capacity – films/litre (unreplenished)	15x135–36
Capacity RC papers/litre (unreplenished)	60 20.3x25.4cm (8x10 inch)
Capacity – FB papers/litre (unreplenished)	30 20.3x25.4cm (8x10 inch)

The process time given is the minimum required, a longer time in the stop bath may be used and should not cause any process problems provided it is not excessive but care must be taken as the indicator dye may give a slight stain to some products. If staining occurs thorough washing will remove it.

There are occasions when a stop bath cannot be included in the process sequence, in those circumstances a water bath or water rinse can be substituted for a stop bath. Using a water bath instead of a stop bath increases the risk of seeing processing related marks and stains, to reduce the risks the water bath must be completely changed at very frequent intervals. If a water bath must be used then fewer fixing problems will be seen if the fixer's activity is monitored and adequate fixer replenishment rates are used.

Storage and solution life

Concentrate

ILFOSTOP concentrate will keep for:-
5 years in full airtight bottles
12 months in half full tightly capped bottles

Working strength

7 working days.

Availability

ILFOSTOP is available in 500ml bottles of concentrate, this makes 10 litres of working strength solution enough to process 150 135–36 or 120 films or 600 20.3x25.4cm (8x10 inch) RC prints or 300 20.3x25.4cm (8x10 inch) FB prints.

ILFOSTOP PRO

ILFORD ILFOSTOP PRO is a low odour acid stop bath without an indicator dye that uses a combination of citric acid and acetic acid as the active ingredients. It stops development immediately and is recommended for all manual and machine film and paper processing applications where a stop bath can be used. ILFOSTOP PRO is the recommended stop bath for all ILFORD scientific products, X-ray films and plates.

pH and specific gravity

	pH	SG at 20°C
ILFOSTOP PRO concentrate	1.00	1.114–1.124

Mixing instructions and use

ILFOSTOP PRO is a liquid concentrate mixed with water 1+19 for use.

For small volumes of solution determine the amount needed for the processing session. Make sure that it is enough to fill a dish/tray to a depth of about half full or to cover the films in a spiral tank completely or fill a deep tank. Measure out the appropriate amount of concentrate using the smallest measuring cylinder appropriate to the liquid volume: it is easier to measure 100ml of solution in a 100ml cylinder than a 1000 ml cylinder.

Add the concentrate to the mixing vessel. A large measuring jug is a good mixing vessel as it provides a check on the total quantity of solution mixed. Using an appropriately sized measuring cylinder, measure out the required dilution water using hot and cold water to get to the solution's working temperature, 20°C/68°F. Use some of this water to rinse out the measuring cylinder used for the concentrate into the mixing vessel. Finally add the remainder of the dilution water to make up to the final working volume and stir the solution thoroughly. The stop bath is then ready to use.

ILFOSTOP PRO can be mixed by using automatic mixing equipment to make the larger volumes of solutions such as would be used in dip and dunk (hanger) processors, etc.

	ILFOSTOP PRO
Dilution	1+19
Temperature range	18–24°C (64–75°F)
Time for film and paper 20°C (68°F)	10 seconds
Capacity – films/litre (unreplenished)	24x135–36
Capacity RC papers/litre (unreplenished)	90 20.3x25.4cm (8x10 inch)
Capacity – FB papers/litre (unreplenished)	45 20.3x25.4cm (8x10 inch)
Replenishment rate film	100–200ml/m^2
Replenishment rate paper	100–200ml/m^2

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 and provided that the fixer activity is monitored and adequate fixer replenishment rates are used there should be no process problems.

There are occasions when a stop bath cannot be included in the process sequence, in those circumstances a water bath or water rinse can be substituted for a stop bath. Using a water bath instead of a stop bath increases the risk of seeing processing related marks and stains, to reduce the risks the water bath must be completely changed at very frequent intervals. If a water bath must be used then fewer fixing problems will be seen if the fixer's activity is monitored and adequate fixer replenishment rates are used.

Storage and solution life

Concentrate

ILFOSTOP PRO concentrate will keep for:-
5 years in full airtight bottles
12 months in half full tightly capped bottles

Working strength

7 working days unreplenished
6-12 months replenished

Availability

ILFOSTOP PRO is available in 5 litres bottles of concentrate, this makes 100 litres of working strength solution enough to process 2400 135/35 or 120 films or 9000 20.3x25.4 (8x10 inch) RC prints or 4500 20.3x 25.4 (8x10 inch) FB prints.

ILFORD ILFOTOL

ILFORD ILFOTOL is a non-ionic wetting agent used as a final rinse before drying films. It can be used in all manual and machine processes to aid rapid, even drying and so greatly reduce the risk of drying marks being formed. ILFOTOL can also be used as a final rinse before drying fibre based prints, again it promotes rapid, even drying. Additionally it can be used to clean glass and plastic lenses and filters and as an anti-static treatment.

Mixing instructions and use

As a final rinse for film we recommend starting with a solution of 5ml of ILFOTOL for each litre of rinse water (1+ 200). The dilution of ILFOTOL needed is dependant on a number of factors and may need some adjustment to get optimum performance for a particular set of circumstances. Performance may vary due the local water quality, the type of processor in use, drying method, etc..

As a final rinse for fibre papers use ILFOTOL diluted 1+200. Immerse the print complete in the rinse bath for a few seconds, the time is not critical, remove the print and drain the excess solution back into the dish/tray. Squeegee the print on both sides, it can then be air-dried at room temperature or heat-dried or glazed/ferrotyped in the usual way.

We recommend that ILFOTOL is measured and dispensed accurately as either too little or too much wetting agent can lead to uneven drying. Use a graduated pipette or eyedropper if very small quantities are needed. NB the ILFORD 1 litre bottle cap will hold approximately 20ml of ILFOTOL brim full, at 1+200 this is enough wetting agent for 4 litres of water.

Foaming will occur if excessive agitation is given to ILFOTOL solutions.

pH and specific gravity

	pH	SG at 20°C
ILFOTOL concentrate	7.00–7.02	1.000–1.005

Storage and solution life

Concentrate

ILFOTOL concentrate will keep for:-
3 years in full airtight bottles
12 months in half full tightly capped bottles.

Working strength

7 working days.

Availability

ILFOTOL is available in 1 litre bottles of concentrate, at 5ml for each litre of water this is makes 200 litres of wetting agent solution.

ILFORD WASHAID

ILFORD WASHAID is a hypo-eliminator formulated to aid the efficient removal of the thiosulphate by-products of fixation by ion exchange. It is particularly useful in speeding up the washing of fibre based papers and is designed to be used with the ILFORD optimum permanence sequences. It can be used to aid the rapid washing of all ILFORD films and fibre papers saving both time and water. It is particularly useful if a hardening fixer has been used.

pH and specific gravity

	pH	SG at 20°C
ILFORD WASHAID 1+4	7.00–7.20	1.020

Mixing instructions and use

ILFORD WASHAID is a liquid concentrate mixed 1+4 with water for use with either film or paper.

Determine the amount of solution needed for the processing session, making sure that it is a least enough to fill the dish/tray to a depth of about half full. Measure out the appropriate amount of concentrate using the smallest measuring cylinder appropriate to the liquid volume: it is easier to measure 100ml of solution in a 100ml cylinder than a 1000ml cylinder.

Add the concentrate to the mixing vessel. A large measuring jug is a good mixing vessel as it provides a check on the total quantity of solution mixed. Using an appropriately sized measuring cylinder, measure out the required dilution water using hot and cold water to get to the solution's working temperature, 20°C/68°F. Use some of this water to rinse out the measuring cylinder used for the concentrate into the mixing vessel. Finally add the remainder of the dilution water to make up to the final working volume and stir the solution thoroughly. The WASHAID is then ready to use.

	ILFORD WASHAID
Dilution	1+4
Temperature range	18–24°C (64–75°F)
Time for FB paper 20°C (68°F)	10 minutes
Time for film 20°C (68°F)	2–3 minutes
Capacity– films/litre	2m^2 (11 ft^2) 40 135/36 films
Capacity – FB papers/litre	40 20.3x25.4 cm (8x10 inch)

The processing sequence is given in the following table

	FB paper	film
First wash, fresh running water	5	1
ILFORD WASHAID 1+4	10	2–3
Final wash, fresh running water	20	5

The water temperature should be 18–24°C/ 65–75°F for washing paper and within 5°C/2°F of the process temperature for washing film.

Optimum permanence for fibre based papers

There are several ways of achieving prints which will have optimum permanence under long term storage conditions. Essentially, prints must have minimum levels of residual silver (adequately fixed) and minimum levels of thiosulphate (adequately washed).

Where short fixing times can be given, the following sequences give extremely low levels of retained fixer and silver compounds. This is achieved by the combination of a very short fixing time and the use of ILFORD WASHAID. These sequences replace the standard fixing and washing sequence.

Optimum permanence sequence

Fixing	ILFORD RAPID FIXER (1+4), intermittent agitation	1min
First wash	Fresh, running water	5min
Rinse	ILFORD WASHAID (1+4), intermittent agitation	10min
Final wash	Fresh, running water	5min

Processing conditions: 18–24°C/65–75°F including wash water.

Optimum permanence sequence with selenium toner

Fixing	ILFORD RAPID FIXER (1+4), intermittent agitation	1min
Toning	Selenium toner diluted with working strength ILFORD WASHAID instead of water, intermittent agitation	*min
Rinse	ILFORD WASHAID (1+4), intermittent agitation	10min
Final wash	Fresh, running water	30min

Processing conditions: 18–24°C/65–75°F including wash water.
*Tone the print for the appropriate time to achieve the depth of colour needed.

Be careful not to exceed the capacity of the fixer and not to extend the fixing time as both of these make washing more difficult.

Storage and solution life

Concentrate

ILFORD WASHAID concentrate will keep for:-
4 years in full airtight bottles
6 months in half full tightly capped bottles.

Working strength

7 working days.

Availability

ILFORD WASHAID is available in 1 litre bottles. A 1 litre bottle of concentrate makes enough working strength solution to process 200 20.3x25.4cm (8x10 inch) fibre based sheets of paper or 200 135/36 films.

ILFORD BIOCLEAN

ILFORD BIOCLEAN is a biocide that can be safely used to help prevent micro-biological contamination in the wash tanks of all photographic process machines. Algae tends to build up on the walls, racks, rollers and in the recirculation system of a processing machine's wash water tank(s) while it is idle. The algae is brought in by the water supply and its growth is sustained by the minute particles of gelatin that come off the film or paper during processing. Growth is assisted by the tepid temperature conditions found in most water tanks.

Once established algae can be very difficult to remove completely and in the worst cases can cause staining or damage to prints or film. It is far better to prevent the build up of algae in the first place and ILFORD BIOCLEAN is designed to do this. ILFORD BIOCLEAN will not clean up a wash tank that is already contaminated with algae but used regularly it will keep a clean wash tank, clean.

Mixing instructions and use

To use add 1ml of ILFORD BIOCLEAN for each litre of water in the wash tank. However if it is to function properly the wash tank must be clean. If the processor is new add the required amount of ILFORD BIOCLEAN as soon as the wash tank has been filled. Thereafter add ILFORD BIOCLEAN to the wash tank at the end of each working day after the processor has been switched off. However, if the processor's wash tank has been used and is already contaminated then clean it and any associated parts by using a dilute solution of household bleach. Make sure the bleach has been thoroughly rinsed away before filling with fresh wash water and adding ILFORD BIOCLEAN.

pH and specific gravity

	pH	SG at 20°C
ILFORD BIOCLEAN concentrate.	3.50	1.020

ILFORD BIOCLEAN must not be mixed with developer and fixer solutions as it can effect their performance.

Storage and solution life Availability

ILFORD BIOCLEAN is available in 5 litres bottles of concentrate, enough to treat 5000 litres of water.

ILFORD ILFOCLEAN

ILFOCLEAN is a developer systems cleaner in four parts, parts A and B the cleaner, part C the neutraliser and part D the de-activator. It will efficiently remove silver deposits from all developer tanks, circulation systems, rollers, racks and developing dishes. It should not be used to clean fixer tanks and dishes or foam rubber rollers or wash tanks.

PART A and PART B are liquids that when mixed remove the silver deposits.

PART C is a powder that neutralises the pH before disposal.

PART D is a powder that deactivates any remaining cleaner and removes the brown deposits formed during the cleaning process.

pH and specific gravity

	pH	SG at 20°C
ILFOCLEAN II Part A.	8.90	1.012–1.022
ILFOCLEAN II Part B.	0.12	1.046–1.066

Warning:

PART A is a deep purple liquid, it will cause stains if it comes into contact with skin or clothing. Do not add PART D directly to a mixture of PART A and PART B as this will result in the emission of sulphur dioxide gas.

Mixing instructions and use

Drain the developer tank and rinse it with water while flushing out the recirculation system.

According to the size of the developer tank being cleaned measure out the appropriate equal amounts of PART A and PART B, see the table below.

Close the drain valves and while filling the tank with clean water add PART A followed by PART B.

Turn the processors drive and recirculation system on. Make sure that no developer replenisher is allowed into the tank during the cleaning process.

After one hour check the tank, (if it was heavily silvered it may need up to two hours) and neutralise the contents by adding PART C. Fizzing will occur as neutralisation takes place. Leave the solution recirculating for another 10 minutes before switching the processor off and emptying the dirty brown contents of the tank. In many areas this can be discharged safely into trade effluent, however, regulations vary between countries and we advise that you consult your local waste water authority for their current guidelines and the legal requirements.

At this stage it is normal for the empty tank and rack to assume a rust like appearance.

Refill the tank with clean water and turn on the drive and re-circulation system again. It is very important to wash out the tank thoroughly to avoid sulphur dioxide emissions when PART D is used. Switch off the processor and drain the tank.

Whilst refilling the tank for a second time with clean water add PART D. It is very important that the final solution level is higher than that used for PARTS A&B, this will ensure removal of all the brown deposits from the tank and rack. Failure to do this will give unsatisfactory results.

Turn on the drive and recirculation system again. After 30 minutes turn the processor off and empty the tank. In many areas this can be discharged safely into trade effluent but again we advise consultation with your local water authority.

Once again refill the tank with clean water and turn on the drive and recirculation system and leave them running for about 10 minutes. Switch off and drain the tank.

Return the processor to its normal operating configuration and refill with fresh developer solution.

A Guide to the quantities of solution to be used

Tank size	Volume PART A	Volume PART B	Weight PART C	Weight PART D
litres	ml	ml	g	g
5–15	250	250	65 (1 bag)	50 (1 bag)
15–25	500	500	130 (2 bags)	100 (2 bags)
25–45	1,000	1,000	260 (4 bags)	260 (4 bags)
45–65	1,500	1,500	390 (6 bags)	390 (6 bags)

Disposal

Prior to disposal of the tank cleaning solutions, PART A and PART B, PART C must be added to the tank to neutralise the acidity. If the amounts in the instructions are followed the pH of the resulting solution is between pH 6 and pH 8, this is usually acceptable for trade effluent disposal. For more information please see the effluent data sheet on our web site www.ilford.com and consult with your local waste water authority.

Storage and solution life

ILFOCLEAN PARTS A and B will keep for 24 months in full tightly capped bottles.

PARTS C and D will keep indefinitely.

Availability

ILFOCLEAN is available as a kit containing 500ml bottles of PART A and PART B, two 65g bags of PART C and two 50g bags of PART D.

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.

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