

TECHNICAL INFORMATION

PAPER CHEMICALS

CHEMICALS FOR TRAY AND MACHINE PROCESSING

Photo by Henri Silberman

ILFORD

TRAY PROCESS CHEMICALS

BROMOPHEN

1 DESCRIPTION

BROMOPHEN is a premium quality powder developer that produces superb results with all types of photographic printing papers. Use BROMOPHEN when the utmost in exhibition quality is desired.

BROMOPHEN is a phenidone-hydroquinone developer specifically designed for use with fiber papers such as ILFORD MULTIGRADE FB and ILFOBROM GALERIE FB, but may be used successfully with resin coated papers as well.

BROMOPHEN is supplied as a powder from which a solution is made by dissolving two separately packaged ingredients. BROMOPHEN is made up as a stock solution and then further diluted for use.

2 PREPARATION AND USE

To mix the stock solution, dissolve the contents of Part A in three quarters of the total volume of warm water at about 120°F (50°C). When most of the powder from Part A has dissolved, add the contents of Part B and stir until all of the powder has dissolved. Add cold water to make up the total volume. Dilute one part of the stock solution with three parts water. A development time of 1½–2 minutes at 68°F (20°C) is recommended.

3 STORAGE

Unopened packages of BROMOPHEN paper developer will keep for approximately three years.

Tightly capped full bottles of stock solution will keep for 4 to 6 months. Tightly capped half-full bottles of stock solution will keep for about 2 months.

4 CAPACITY

One liter of BROMOPHEN paper developer diluted 1+3 will process about 40 8x10 inch fiber base prints and 70–80 8x10 inch resin coated prints.

MULTIGRADE CHEMICALS

MULTIGRADE DEVELOPER

1 DESCRIPTION

MULTIGRADE developer is an economical developer primarily recommended for use with MULTIGRADE papers. Use this versatile developer to process both resin coated and fiber base enlarging papers.

2 PREPARATION AND USE

MULTIGRADE developer is supplied as a liquid concentrate and is economical to use. The recommended dilution is 1 part developer mixed with 9 parts water. Mix only as much developer as is needed for that particular printing session.

For MULTIGRADE IV RC DELUXE and MULTIGRADE III RC RAPID papers, the image appears after 10 seconds and development, at 68°F (20°C), is complete in 1 minute. This development time produces prints identical in contrast and maximum density to prints processed for two minutes in a conventional tray developer.

For MULTIGRADE FB papers, the image appears after 35 seconds with a development range of 1½–3 minutes at 68°F (20°C). Development may be extended to 6 minutes without any noticeable change in contrast or fog.

For greater development control and added economy, MULTIGRADE developer can also be diluted at 1+14. Diluted MULTIGRADE developer will stay in good condition in an open tray for two working days, at dilution 1+9 and for one working day, at dilution 1+14.

3 STORAGE

Unopened bottles of MULTIGRADE developer will keep approximately 24 months. Tightly capped half-full bottles will keep for up to 6 months.

4 CAPACITY

One liter of working strength developer will process up to 50 8x10 inch fiber base prints and 100 resin coated prints.

MULTIGRADE FIXER

1 DESCRIPTION

MULTIGRADE fixer is a non-hardening ammonium thiosulfate fixer recommended for use with resin coated and fiber base papers.

2 PREPARATION AND USE

MULTIGRADE fixer is diluted 1 part concentrate with 4 parts water to make a working strength solution.

Rinse prints in a stop bath, then transfer to MULTIGRADE fixer. Agitate prints initially then fix resin coated papers for 30 seconds and fiber base papers for 60 seconds at 68°F (20°C).

3 STORAGE

Unopened bottles of MULTIGRADE fixer will keep for 24 months. A tightly capped half-full bottle will keep for 6 months.

4 CAPACITY

Fixer capacity varies depending on Life Expectancy (LE) requirements. Listed below are the recommended numbers of 8x10 inch prints that may be processed in one liter of working strength fixer.

Paper	Commercial (LE <25 Yrs.)	Archival (LE >100 Yrs.)
Resin Coated	80	40*
Fiber Base	40	10
Fiber Base (ILFORD Archival Sequence)	—	40+

+Print capacity increases when following the ILFORD Archival Processing Sequence using UNIVERSAL wash aid.

*Information based on accelerated aging tests and does not reflect real time testing.

UNIVERSAL CHEMICALS

UNIVERSAL PAPER DEVELOPER

1 DESCRIPTION

UNIVERSAL paper developer is a phenidone based developer supplied as a liquid concentrate. It is for use with graded and variable contrast papers on both a resin coated or fiber base. The 16 oz. bottle makes five quarts of working strength solution and a developing time of 1½ minutes is recommended for all papers. This can be adjusted up or down depending on the required results.

2 PREPARATION AND USE

This economical liquid concentrate should be diluted 1 part developer mixed with 9 parts water for working strength solution. Mix only as much developer as is needed for that particular printing session. Development times can range from 35 seconds to two minutes at 68°F (20°C). UNIVERSAL paper developer will produce a neutral image color with all ILFORD papers.

3 STORAGE

Unopened bottles of UNIVERSAL paper developer concentrate will keep for about 18 months. A tightly capped half-full bottle will keep for at least three months.

4 CAPACITY

One liter of working strength developer will process about 45 8x10 inch fiber base prints and 70–80 resin coated prints.

IN-1 STOP BATH

1 DESCRIPTION

After development, prints should be rinsed in IN-1 stop bath. The use of a stop bath terminates development immediately and helps maintain the fixer bath in good condition. IN-1 contains an indicator color which changes from bright orange to purple when the stop bath should be discarded.

2 PREPARATION AND USE

IN-1 stop bath is a specially formulated acid stop bath which is diluted 1+31 for use. It is available in a 16 oz. bottle which makes 4 gallons of working strength solution. For greater economy, mix IN-1 stop bath 1+63. This dilution is useful for short printing sessions where the solution will be discarded immediately after use.

3 STORAGE

Unopened bottles of IN-1 stop bath concentrate will keep for about 36 months. A tightly capped half-full bottle will keep for at least three months.

4 CAPACITY

Discard IN-1 stop bath when the indicator turns from bright orange to purple. Alternatively, discard the solution if the prints still feel slimy after 10 seconds in the bath.

UNIVERSAL RAPID FIXER

1 DESCRIPTION

ILFORD has always recommended the use of non-hardening fixers as they allow for the use of shorter wash times. ILFORD papers will process satisfactorily without hardener to around 83°F. The higher the temperature, the more care is needed to avoid damaging the emulsion when handling wet paper.

2 PREPARATION AND USE

UNIVERSAL Rapid fixer is a rapid acting ammonium thio-sulfate fixer which does not contain a hardener. It is ideally suited for use with ILFORD films and papers. Supplied as a liquid concentrate, it is diluted with three parts of water for use. Fix resin coated papers for just 30 seconds and fiber base papers for only 60 seconds at 68°F (20°C). Films can be effectively fixed in 2–5 minutes at 68°F (20°C).

3 STORAGE

Unopened full bottles of UNIVERSAL Rapid fixer concentrate will keep for about 12 months and a tightly capped half-full bottle of concentrate will keep for at least six months.

4 CAPACITY

Fixer capacity varies depending on Life Expectancy (LE) requirements. Listed below are the recommended numbers of 8x10 inch prints that may be processed in one liter of working strength fixer.

Paper	Commercial (LE <25 Yrs.)	Archival (LE >100 Yrs.)
Resin Coated	80	40*
Fiber Base	40	10
Fiber Base (ILFORD Archival Sequence)	—	40+

+Print capacity increases when following the ILFORD Archival Processing Sequence using UNIVERSAL wash aid.

*Information based on accelerated aging tests and does not reflect real time testing.

UNIVERSAL WASH AID

1 DESCRIPTION

UNIVERSAL wash aid is specifically formulated to aid the efficient removal of the by-products of fixing and recommended for use with fiber base papers. Used as part of ILFORD's Archival Processing Sequence, total process times may be reduced by one half.

2 PREPARATION AND USE

UNIVERSAL wash aid is supplied as a liquid concentrate and is diluted 1+4 with water to make a working strength solution. After a five minute wash in running water, immerse prints in UNIVERSAL wash aid for 10 minutes. Follow with a five minute wash in fresh running water and then dry the prints.

3 STORAGE

Unopened full bottles of UNIVERSAL wash aid will keep for about 24 months. A tightly capped half-full bottle will keep for about six months.

4 CAPACITY

One liter of working strength wash aid will process 40 8x10 inch prints.

MACHINE PROCESS CHEMICALS

ILFORD 2150 XL CHEMICALS

1 DESCRIPTION

ILFORD 2150 XL developer and fixer are liquid concentrates specially formulated for processing MULTIGRADE IV RC DELUXE, MULTIGRADE III RC RAPID, ILFOSPEED RC DELUXE, and all resin coated papers in the ILFORD ILFOLAB 2150 RC Processor.

ILFORD 2150 XL developer is a phenidone-hydroquinone based paper developer supplied in liquid form. Designed with machine processing in mind, ILFORD 2150 XL developer gives peak performance at high temperatures. It is a clean running, long lasting developer which will produce stable results throughout its life.

ILFORD 2150 XL fixer is an ammonium thiosulfate non-hardening rapid fixer. Especially devised for rapid access processing systems, it provides effective fixing in as little as eighteen seconds. Supplied as a liquid concentrate, ILFORD 2150 XL fixer mixes quickly and easily.

2 PREPARATION AND USE

2.1 ILFOLAB 2150 RC PROCESSOR

The ILFOLAB 2150 RC Processor requires one gallon each of ILFORD 2150 XL developer and fixer concentrates to be placed in the appropriate reservoirs. Simply pour them into the processor where they will automatically be diluted for use.

ILFORD 2150 XL developer and fixer were specifically formulated for long use without replenishment. Typically, the solutions are used for two weeks or 1000 8x10 inch prints, whichever comes first, before being discarded. This is equivalent to 80,000 sq. in. of paper.

2.2 MACHINE BATCH PROCESSING

ILFORD 2150 XL developer and fixer can also be used in batch system, table-top paper processors. A full mix of each concentrate makes fourteen liters of working strength solution. Most non-replenishment systems will require only a partial mix. Both concentrates are mixed 1 part chemical to 2.5 parts of water.

Determine first the tank size being used, measure out the appropriate quantity of chemical, then add water to make up the final volume.

Volume Required	ILFORD 2150 XL Chemical	Water
1 liter	285ml	715ml
1 gallon	36.5 ounces	91.5 ounces

Multiply the tank size by the amounts given above to determine solution requirements. One liter of ILFORD 2150 XL chemicals will process up to 70 8x10 B&W prints or 5,600 sq. in. of B&W paper.

ILFORD 2150 XL developer and fixer can be used at various temperatures with a preferred range of 68°F–95°F. Use the following guide when setting machine temperature and speed:

Temperature	Immersion Time
68°F (20°C)	46 seconds
77°F (25°C)	32 seconds
86°F (30°C)	22 seconds
95°F (35°C)	17 seconds

This is ONLY a guide and actual processing cycles may vary. Use the same time for all chemical baths. To extend fixer life, a water rinse or stop bath between developer and fixer is preferred.

3 STORAGE

Unopened bottles of ILFORD 2150 XL developer and fixer concentrates will store up to 18 months. Once opened, the developer will keep for four months while the fixer can be used for up to six months if kept tightly capped.

When a full mix is used, ILFORD 2150 XL developer and fixer have a working life of up to fourteen days. Partial mixes may perform for up to five days.

Keep unopened bottles in a cool place. Do not allow the chemicals to freeze.

ILFORD 2000 RT CHEMICALS

1 DESCRIPTION

ILFORD 2000 RT chemicals have been specifically designed for processing ILFORD ILFOSPEED RC DELUXE, MULTIGRADE RC and all resin coated papers in replenishable roller transport processors.

ILFORD 2000 RT chemicals can also be used with all fiber base papers such as MULTIGRADE FB in continuous processors.

2 PREPARATION AND USE

2.1 DEVELOPER/REPLENISHER

ILFORD 2000 RT developer/replenisher is supplied as a liquid concentrate packaged in 2½ gallon cubitainers. Dilute 1 part concentrate with 4 parts water to make working strength developer and replenisher. Mix thoroughly.

ILFORD 2000 RT developer/replenisher is formulated for use at normal or rapid access processing temperatures of 68°F to 95°F (20°C–35°C). Initially set the developer replenishment rate at 7.5ml for each 8x10 inch sheet or 13.5ml/ft² of material being processed. This quantity will provide adequate replenishment for most processors. This rate may be adjusted if necessary.

The pH of freshly mixed replenisher solution is 10.5±0.5. The specific gravity, taken at 68°F, is 1.058±0.05.

2.2 FIXER/REPLENISHER

ILFORD 2000 RT fixer/replenisher is a non-hardening rapid fixer also supplied as a liquid concentrate in master cartons containing two 2½ gallon cubitainers. Dilute 1 part concentrate with 4 parts water to make working strength fixer and replenisher. Mix thoroughly.

ILFORD 2000 RT fixer/replenisher is formulated for use at processing temperatures of 68°F to 90°F (20°C–32°C). Since it is a non-hardening fixer, it permits shorter and more efficient washing with resin coated papers.

Replenish the working strength fixer at an initial rate of 12.5ml for each 8x10 inch sheet or 22.5ml/ft² of material being processed. This rate will provide adequate replenishment for most processors but may be adjusted if necessary.

The pH of freshly mixed replenisher solution is 5.05±1.0. The specific gravity, taken at 68°F, is 1.078±0.05.

2.3 MACHINE PROCESSING

Use the following guide when setting up machines to process ILFORD resin coated papers. This guide is a starting point only and the actual processing cycle must be individually set for each make of processor.

Temperature	Development Time
68°F (20°C)	45–50 seconds
77°F (25°C)	30–35 seconds
86°F (30°C)	20–25 seconds
95°F (35°C)	15–20 seconds

The preferred temperature range is 68°F (20°C) to 86°F (30°C). Times are suitable for replenished systems with a solution life of 3 months.

The solution life is dependent on paper throughput. A suggested minimum is 30ft² or 54 8x10 inch sheets of paper per liter (0.26 gallons) of working strength solution per week. If throughput is considerably less than this, the chemicals may degrade prematurely. To maintain print quality, it may be necessary either to mix fresh tank solution every 6 weeks or double the replenishment rate.

Use the same fixing times and temperatures as those recommended for development. Fixer replenishment should be sufficient to maintain a maximum of 4 grams/liter of silver in the fixer bath.

Wash papers that are machine processed with ILFORD 2000 RT chemicals according to the recommendations of the processor manufacturer.

3 STORAGE

Unopened bottles of ILFORD 2000 RT chemicals will store for up to 18 months. Once opened, the developer will keep for about 4 months and the fixer for 6 months in tightly capped bottles.

ILFORD MULTIGRADE III RAPID RP CHEMICALS

1 DESCRIPTION

ILFORD MULTIGRADE III RAPID RP chemicals are specially formulated to allow ILFORD MULTIGRADE III RC RAPID resin coated papers to be used in the Kodak Royalprint Processor.

2 PREPARATION AND USE

ILFORD recommends ILFORD MULTIGRADE III RAPID RP chemicals to be installed in standard Kodak Royalprint Processors to obtain optimum quality results from MULTIGRADE III RC RAPID paper. MULTIGRADE III RAPID RP activator is supplied pre-mixed in ready to use form. Slowly pour directly into the tank for use.

MULTIGRADE III RAPID RP stop bath comes pre-mixed and ready for use. Slowly pour stop bath directly into the processor.

MULTIGRADE III RAPID RP fix is a liquid supplied in two parts. Part A can be used alone and put directly into the machine. Water is then added until it reaches the fill mark on the fixer sight gauge. It may also be diluted 1+3 outside the machine.

MULTIGRADE III RAPID RP fix Part B is a unique additive that controls image tone. Omission of Part B will produce a cold toned image, but will not affect print permanence. For warmer image tone, one bottle of MULTIGRADE III RAPID RP fix Part B is introduced into the machine directly after pouring in the Part A. Water is then added to the fill mark as usual.

ILFORD MULTIGRADE III RAPID RP chemicals are intended to be used in either batch or replenishment process systems. For batch processing, change chemicals when any one of the following conditions occurs:

1. After processing the equivalent of 1000 8x10 B&W prints;
2. After the solutions are one week old;
3. After using 3 bottles of water to replenish the activator.

When using ILFORD MULTIGRADE III RAPID RP chemicals in a replenished system, replenishment is set according to paper width. Rates are given in the operating guides for the Roll Feed Adapter or Replenishment Assembly.

3 STORAGE

Unopened bottles of ILFORD MULTIGRADE III RAPID RP chemicals will store for up to one year.

Keep unopened bottles in a cool place. Do not allow the solutions to freeze.

ILFORD may modify its products from time to time and consequently the information given in this publication is subject to change without notice.

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ENVIRONMENTAL AND SAFETY CONSIDERATIONS

ILFORD makes every effort to comply with recognized national and international authorities for proper user safety and environmental protection.

Photographic chemicals are not hazardous when used correctly and when basic rules of common sense are observed. On each container of ILFORD chemicals, one will always find health and safety recommendations, as a guide to safe handling and use.

Detailed safe handling, first aid, disposal and transportation information is contained in the Material Safety Data Sheets (MSDS) for each ILFORD photo chemical product. Additional MSDS can be obtained from your supplier or by directly contacting ILFORD Technical Service at (201) 265-6000 or the address below.

KEEP ALL PHOTO PROCESSING CHEMICALS OUT OF THE REACH OF CHILDREN.

For your safety, always use face or eye protection and wear suitable rubber gloves when handling or mixing chemicals. Use only in well ventilated areas. Do not eat, drink or smoke in areas where chemicals are handled or used.

Call the Emergency Response Center at 1-800-842-9660 (24 hours) for medical emergency information.