

## TECHNICAL INFORMATION

**FP4 PLUS****ISO 125/22°, BLACK AND WHITE PROFESSIONAL FILM FOR HIGH PRINT QUALITY AND FLEXIBILITY IN USE**

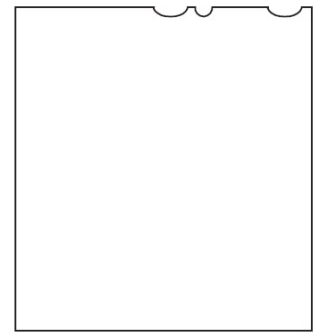
**ILFORD FP4 Plus** is an exceptionally fine grain, medium speed black and white film. It is ideal for high quality indoor and outdoor photography, particularly when giant enlargements are to be made. In addition to general photography, FP4 Plus is also suited to copying and internegative work, and has many applications in scientific, technical and industrial photography.

FP4 Plus is robust and will give usable results even if it is overexposed by as much as six stops, or underexposed by two stops. It is compatible with all major processing systems, including those which give the standard short fixing and washing times.

FP4 Plus 35mm film is coated on 0.125mm/5-mil acetate base and is available in 24 or 36 exposure cassettes, or in bulk lengths of 17 or 30.5 metres (56 and 100ft). FP4 Plus 35mm film is supplied in DX coded cassettes, suitable for all 35mm cameras.

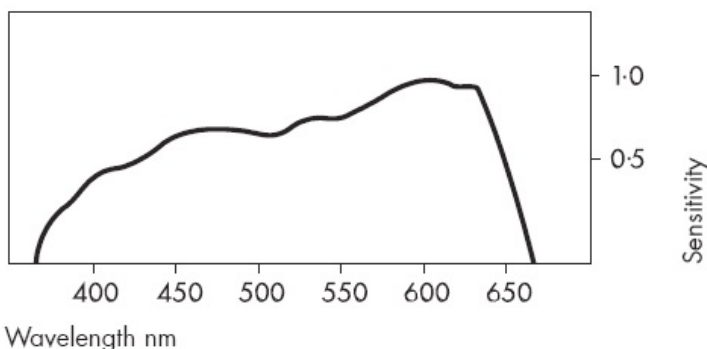
FP4 Plus roll film is coated on 0.110mm/4-mil clear acetate base with an anti-halation backing which clears during development. It is available in 120 lengths and is edge numbered 1 to 19.

FP4 Plus sheet film is coated on 0.180mm/7-mil polyester base with an anti-halation backing which clears during development. It is available in a wide range of standard sizes. The emulsion faces the user when sheet film is held in the position shown opposite.

**EXPOSURE RATING**

FP4 Plus has a speed rating of ISO 125/22° to daylight. The ISO speed rating was measured using ILFORD ID-11 developer at 20°C/68°F with intermittent agitation in a spiral tank.

Best results are obtained at EI 125/22, but good image quality will also be obtained at meter settings from EI 50/18 to EI 200/24. It should be noted that the exposure index (EI) range recommended for FP4 Plus is based on a practical evaluation of film speed and is not based on foot speed, as is the ISO standard.

**SPECTRAL SENSITIVITY****Wedge spectrogram to tungsten light (2850K)**

**FILTER FACTORS**

FP4 Plus film may be used with all types of filters (e.g. colour, polarising and neutral density filters) in the usual way. Follow the instructions given by the filter manufacturer.

The exposure increase in daylight may vary with the angle of the sun and the time of day. In the late afternoon or the winter months, when daylight contains more red light, green and blue filters may need slightly more exposure than usual.

Cameras with through-the-lens metering will usually adjust the exposure automatically when using filters. With some automatic exposure cameras, the correction given for deep red and orange filters can produce negatives under exposed by as much as 1 ½ stops.

**MAKING LONG EXPOSURES**

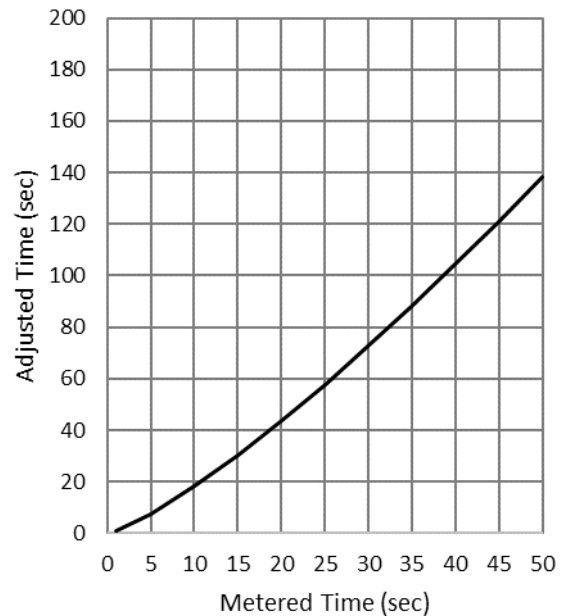
For exposures between ½ and 1/10 000 second, no adjustments are needed for reciprocity law failure.

When exposures longer than ½ second are given, FP4 Plus, along with other films, needs to be given more exposure than indicated by a meter. Use the graph to calculate the increased exposure time which should be given once the metered time is known.

The graph is based on the formulae  $T_a = T_m^{1.26}$

$T_a$  = Adjusted Time

$T_m$  = Metered Time



**CHOOSING THE BEST ILFORD DEVELOPER FOR THE JOB**

**Manual processing Spiral tank, dish/tray, deep tank Including rotary processors**

	Liquid	Powder
Best overall image quality	ILFOTEC DD-X	ID-11 (stock)
Finest grain	ILFOTEC DD-X	PERCEPTOL (stock)
Maximum sharpness	ILFOSOL 3 (1+9)	ID-11 (1+3)
Maximum film speed	ILFOTEC DD-X	MICROPHEN (stock)
Economy	ILFOTEC LC29 (1+29)	ID-11 (1+3) MICROPHEN (1+3)
One-shot convenience	ILFOSOL 3 (1+9) ILFOTEC DD-X	ID-11 (1+1) MICROPHEN (1+1)
Replenishable	ILFOTEC DD-X	ID-11

**Machine Processing**

Dip and dunk	ILFOTEC DD	Best overall image quality (liquid) and long tank life
Short leader	ILFOTEC RT RAPID	Rapid processing, best overall image quality and long tank life.
Roller transport	ILFOTEC RT RAPID	Rapid processing

**DEVELOPMENT TIMES**

The table below gives development times for both manual and machine processing FP4 Plus. These times will produce negatives of average contrast suitable for printing in all enlargers. The development times are intended as a guide and may be altered if a different result is needed.

For manual processing in spiral tanks and deep tanks, the development times are based on intermittent agitation. Where continuous agitation is used for manual processing (as in a dish/tray or with some types of developing tank), reduce these times by up to 15%. For use in rotary processors without a pre-rinse, reduce the spiral tank development times by up to 15%. A pre-rinse is not recommended as it can lead to uneven processing.

**35mm and Roll Film**

ILFORD developer	Dilution	Meter setting (EI)		
		50/18	125/22	200/24

**Spiral tank, deep tank, dip and dunk machines (min/20°C/68°F)**

ILFOTEC DD-X	1+4	8	10	12
ILFOSOL 3	1+9	–	4¼	–
	1+14	–	7½	–
ILFOTEC HC	1+15	–	4	5
	1+31	6	8	9
ILFOTEC LC29	1+9	–	4	5
	1+19	6	8	9
	1+29	8	12	–
ID-11	stock	6½	8½	10
	1+1	8	11	15
	1+3	17	20	–
MICROPHEN	stock	–	8	9
	1+1	–	10	14
	1+3	–	14	18
PERCEPTOL	stock	9	12	–
	1+1	13	15	–
	1+3	17	21	–

**Non-ILFORD Developers (min/20°C/68°F)**

Acufine	stock	–	4	6
Rodinal	1+25	–	9	13
	1+50	–	15	20
Kodak D-76	stock	6	8	9
	1+1	9	11	15
	1+3	14	16	20
Kodak HC-110	A	–	4½	6
	B	6	9	12
Kodak T-Max	1+4	–	8	9
Tetenal Ultrafin SF	Stock	–	7	9
	1+1	–	11	14
Tetenal Ultrafin Plus	1+4	–	6	9
Kodak Xtol	stock	–	8½	10

**35mm and Roll Film**

ILFORD developer	Dilution	Meter setting (EI)	800/30	1600/33	3200/36

**Dip and dunk machines (min/24°C/75°F)**

ILFOTEC DD	1+4	7	8½	11½
Kodak T-Max RS	stock	-	7½	-
Kodak Xtol	stock	-	7	10½

**ILFOLAB FP40, roller transport and short leader machines (sec/26°C/79°F)**

ILFOTEC RT RAPID	1+1+2	40	45	54
	1+1+5	55	65	84

**METER SETTINGS BELOW EI50/18 AND ABOVE EI 200/24**

If FP4 Plus has been inadvertently exposed at settings below EI 50/18 or above EI 200/24, the following guide will ensure usable negatives are obtained. Obviously, the quality of negatives processed in this way will not be so high as conventionally processed ones.

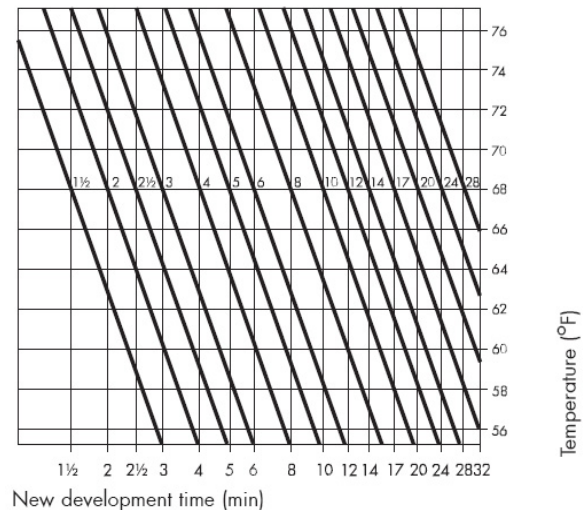
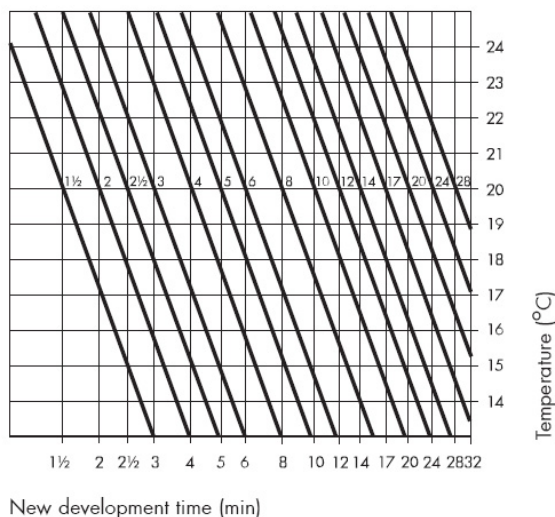
**Manual processing (min /20°C/68°F) accidental exposure only**

Developer	Dilution	Meter setting 25/15 and below	Meter setting 400/27 and above
MICROPHEN	Stock	-	16
PERCEPTOL	Stock	8½	-

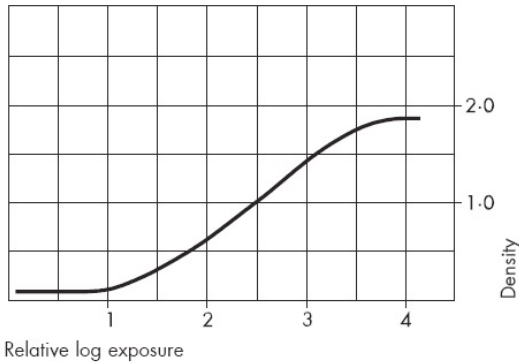
**Note.** Development times may need adjusting to suit individual processing systems and working practices. If an established system is producing good results, adjust the recommended development times until the desired contrast level is obtained. Development times for some other manufacturers' developers are included for your convenience and are only a general guide. Other manufacturers can and do change their product specifications from time to time, and the development times may change as a result.

**Processing at Different Temperatures**

FP4 Plus film can be processed over a range of temperatures. Development times at temperatures other than 20°C/68°F may 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 min and the time at 16°C/61°F will be 6 min.



## CHARACTERISTIC CURVE



FP4 Plus roll film developed in ILFORD ILFOTEC HC (1+31) for 8 minutes at 20°C/68°F with intermittent agitation. This curve is also representative of the 35mm and sheet film formats.

## PROCESSING

FP4 Plus can be processed in all types of processing equipment including spiral tanks, rotary processors, dishes/trays, deep tanks and automatic processors. Standard capacity figures and replenishment rates can be maintained. FP4 Plus is very robust in processing and will tolerate less than ideal processing conditions. Also, it will not contaminate the processing chemicals.

### Safelight recommendations

Handle FP4 Plus film in total darkness.

### Agitation

Intermittent agitation is recommended for use in spiral tanks and deep tanks. With spiral tanks, invert the tank four times during the first 10 seconds, then invert the tank four times again during the first 10 seconds of each further minute. Otherwise, follow the recommendations given by the processing equipment manufacturer. For sheet film, continuous agitation is recommended in dishes/trays by rocking the dish/tray.

### 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 the film can be rinsed in water but we recommend that an acid stop bath is used such as ILFORD ILFOSTOP (with indicator dye). ILFOSTOP is also recommended for all machine processing applications. When tanks or dishes (trays) 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 ILFOSTOP

Dilution	1+19
Temperature Range	18–24°C (64–75°F)
Time (sec) at 20°C (68°F)	10
Capacity (films per litre, unrefilled)	15x (135-36)

The process time given is the minimum required, if necessary, a longer time may be used and should not cause any process problems provided it is not excessive

## FP4 PLUS Technical Information

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### Fix

The recommended fixers are ILFORD RAPID FIXER or ILFORD HYPAM FIXER.

### ILFORD RAPID OR HYPAM FIXERS

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Dilution	1+4
Temperature Range	18–24°C (64–75°F)
Time (mins) at 20°C (68°F)	2-5
Capacity (films per litre, unrefilled)	24x (135-36)

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### Wash

Wash the films in running water for 5–10 minutes at a temperature within 5°C (9°F) of the process temperature. Or see note below for greater economy when using spiral tanks.

**Note:** For spiral tank use, the following method of washing is recommended. This method of washing is faster, uses less water yet still gives negatives suitable for long term storage.

After fixing, fill the spiral tank with water at the same temperature,  $\pm 5^{\circ}\text{C}$  (9°F), as the processing solutions and invert it five times. Drain the water away and refill. Invert the tank ten times. Once more drain the water away and refill. Finally, invert the tank twenty times and drain the water away.

### Rinse

For a final rinse use ILFORD ILFOTOL wetting agent added to water, it helps the film to dry rapidly and 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 and drying method. Too little or too much wetting agent can lead to uneven drying. Remove excess rinse solution from the film before drying.

### Drying

To avoid drying marks, use a clean squeegee or chamois cloth to wipe FP4 Plus film before hanging it to dry. Dry FP4 Plus at 30–40°C/86-104°F in a drying cabinet or at room temperature in a clean dust-free area.

### STORAGE

For immediate use, store FP4 Plus in a cool (10–20°C/50-68°F), dry place in its original packaging. FP4 Plus may be stored in a fridge/freezer but allow plenty of time for the film to acclimatise prior to use.

### Exposed film

Once exposed, process FP4 Plus as soon as practical.

Exposed films should always be stored in cool, dry conditions - as recommended above.

### Negatives

Store processed negatives in a cool (10–20°C/50-68°F), dry place, in the dark. Suitable storage sleeves include those made of cellulose triacetate, Mylar, paper (pH6.5–7.5) or inert polyester.

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

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