TECHNICAL INFORMATION

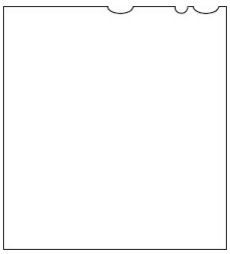
HP5 PLUS

ISO 400/27°, BLACK AND WHITE PROFESSIONAL FILM FOR HIGH PRINT QUALITY AND FLEXIBILITY IN USE

ILFORD HP5 Plus is a fast black and white film. It is ideal for action, available light and general-purpose photography. HP5 Plus is compatible with all major processing systems, including those which give the standard short fixing and washing times.

Although rated at ISO 400/27°, HP5 Plus can produce high quality prints when exposed at meter settings up to EI 3200/36 and given extended development in ILFORD ILFOTEC DD-X, ILFOTEC HC, MICROPHEN or ILFOTEC RT RAPID developers.

HP5 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 30.5 metres (100ft). HP5 Plus 35mm film is supplied in DX coded cassettes, suitable for all 35mm cameras.



HP5 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.

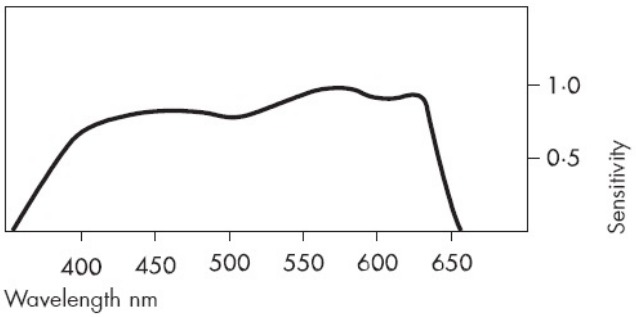
HP5 Plus sheet film is coated on 0.180mm/7-mil polyester base with an anti-halation backing which clears during development. It is available in a wide range of standard sizes. The emulsion faces the user when sheet film is held in the position shown.

EXPOSURE RATING

Best results are obtained at EI 400/27, but good image quality will also be obtained at meter settings from EI 400/27 to EI 3200/36. It should be noted that the exposure index (EI) range recommended for HP5 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

HP5 Plus film may be used with all types of filters (eg 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 1½ stops.

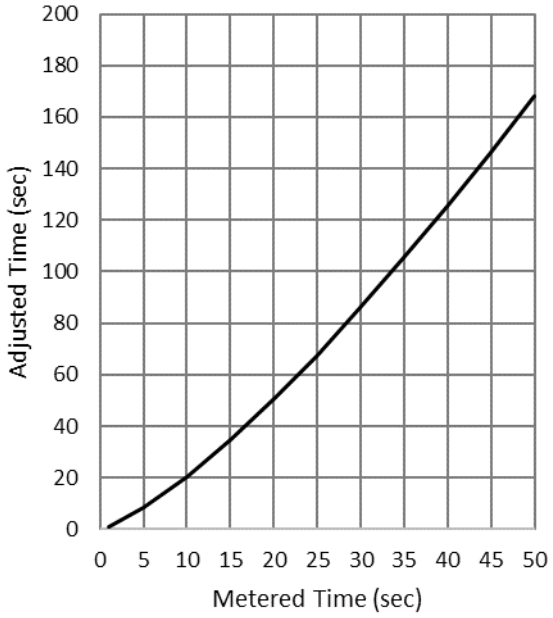
MAKING LONG EXPOSURES

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, HP5 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 $Ta = Tm^{1.31}$

Ta = Adjusted Time
Tm = 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		
EI 400/27, EI 800/30	ILFOTEC DD-X	ID-11 (stock)
EI 1600/33, EI 3200/36	ILFOTEC DD-X	MICROPHEN (stock)
Finest grain	ILFOTEC DD-X	PERCEPTOL (stock)
Maximum sharpness	ILFOSOL 3 (1+9)	ID-11 (1+3)
Maximum film speed (EI 3200/36)	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 HC	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 HP5 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 to15%. A pre-rinse is not recommended as it can lead to uneven processing.

35mm and Roll Film

ILFORD developer	Dilution	Meter setting (EI) 200/24	250/25	320/26	400/27	800/30	1600/33	3200/36
Spiral tank, deep tank, dip and dunk machines (min/20°C/68°F)								
ILFOTEC DD-X	1+4	–	–	–	9	10	13	20
ILFOSOL 3	1+9	5	–	–	6½	13½	–	–
	1+14	7	–	–	11	19½	–	–
ILFOTEC HC	1+15	–	–	–	3½	5	7½	11
	1+31	–	–	–	6½	9½	14	–
ILFOTEC LC29	1+9	–	–	–	3½	5	7½	11
	1+19	–	–	–	6½	9½	14	–
	1+29	–	–	–	9	–	–	–
ID-11	stock	–	–	–	7½	10½	14	–
	1+1	–	–	–	13	16½	–	–
	1+3	–	–	–	20	–	–	–
MICROPHEN	stock	–	–	–	6½	8	11	16
	1+1	–	–	–	12	15	–	–
	1+3	–	–	–	23	–	–	–
PERCEPTOL	stock	–	13	–	–	–	–	–
	1+1	–	–	18	–	–	–	–
	1+3	–	–	25	–	–	–	–
Non-ILFORD Developers (min/20°C/68°F)								
Acufine	stock	–	–	–	4½	6½	9½	–
Agfa Rodinal	1+25	–	–	–	6	8	–	–
	1+50	–	–	–	11	–	–	–
Kodak D-76	stock	–	–	–	7½	9½	12½	–
	1+1	–	–	–	11	13	–	–
	1+3	–	–	–	22	–	–	–
Kodak HC-110	A	–	–	–	2½	3¾	5½	9½
	B	–	–	–	5	7½	11	–
Kodak T-Max	1+4	–	–	–	6½	8	9½	11½
Tetenal Ultrafin SF	Stock	–	–	–	7½	10	–	–
	1+1	–	–	–	16	–	–	–
Tetenal Ultrafin Plus	1+4	–	–	–	7	10	13	–
Kodak Xtol	stock	–	–	–	8	11	14	19
	1+1	–	–	–	12	17	–	–

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 in 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.

		35mm and Roll Film						
ILFORD developer	Dilution	Meter setting (EI) 200/24	250/25	320/26	400/27	800/30	1600/33	3200/36
Dip and dunk machines (min/24°C/75°F)								
ILFOTEC DD	1+4	–	–	–	7	10	14	18
Kodak T-Max RS	stock	–	–	–	4½	5	7	–
Kodak Xtol	stock	–	–	–	7½	9½	12	16
ILFOLAB FP40, roller transport and short leader machines (sec/26°C/79°F)								
ILFOTEC RT RAPID	1+1+2	–	–	–	60	75	91	108
	1+1+5	–	–	–	70	95	120	166

PROCESSING

If HP5 Plus film has been inadvertently exposed at settings below EI 250 / 25, 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.

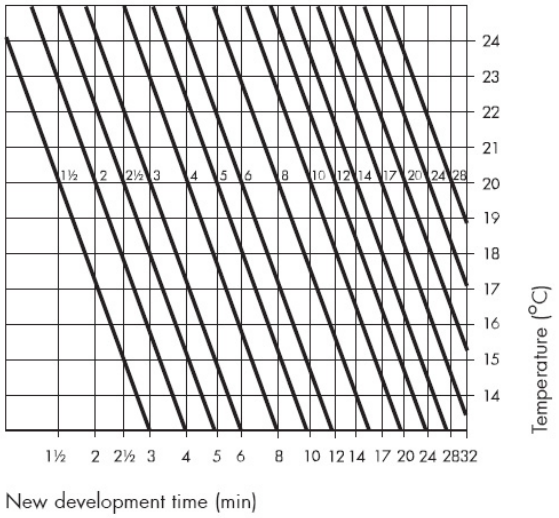
Manual processing (min /20°C/68°F) accidental exposure only

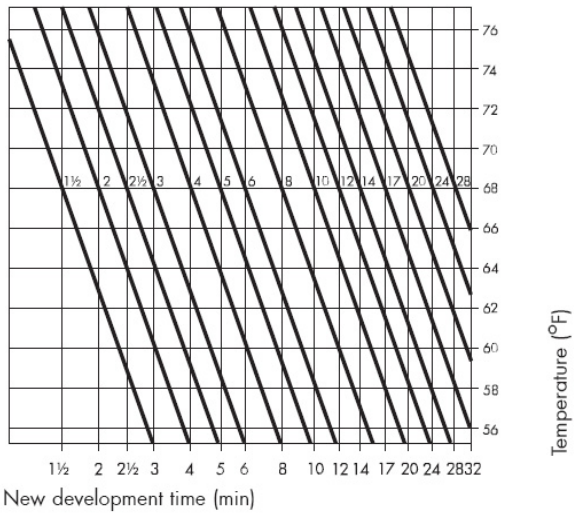
Developer	Dilution	Meter setting 50 / 18	Meter setting 100 / 21	Meter setting EI 200 / 24
PERCEPTOL	Stock	9	9	11

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.

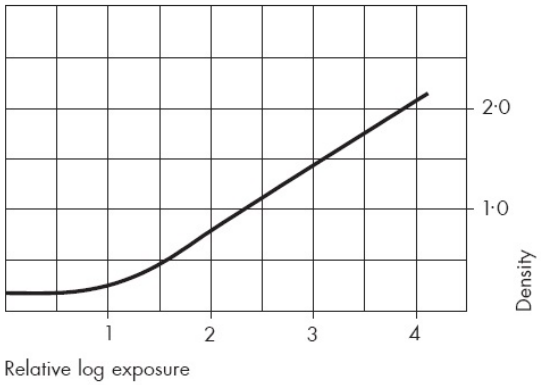
Processing at Different Temperatures

HP5 Plus film can be processed over a range of temperatures. Approximate development times at temperatures other than 20°C/68°F may be calculated from the charts below. For example, if 6 minutes at 20°C/68°F is recommended, the time at 23°C/73°F will be 4½ min and the time at 16°C/61°F will be 9 min.





CHARACTERISTIC CURVE



HP5 Plus film developed in ILFORD ILFOTEC HC (1+31) stock for 6½ minutes at 20°C/68°F with intermittent agitation. This curve is also representative of roll film and sheet film formats.

PROCESSING

HP5 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.

Safelight recommendations

Handle HP5 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. 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, unreplenished)	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

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

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.

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

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, +/– 5°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 HP5 Plus film before hanging it to dry. Dry HP5 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 HP5 Plus in a cool (10–20°C/50-68°F), dry place in its original packaging.
HP5 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 HP5 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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