

ILFORD**HARMAN** technology Ltd

TECHNICAL INFORMATION

DELTA 3200

PROFESSIONAL

EI 3200/36, HIGH SPEED, BLACK AND WHITE PROFESSIONAL FILM
FOR SUPERB PRINT QUALITY

ILFORD DELTA 3200 PROFESSIONAL is a high speed, black and white professional film for making quality photographs in difficult exposing conditions. It is ideal for action and available light photography. It is designed to be exposed at EI 3200/36 and given extended development. Recommended developers are ILFORD ILFOTEC DD-X, ILFORD MICROPHEN and ILFORD ID-11.

DELTA 3200 Professional 35mm film is coated on 0.125mm/5-mil acetate base and is available in 36 exposure cassettes. DELTA 3200 Professional 35mm film is supplied in DX coded cassettes, suitable for all 35mm cameras.

DELTA 3200 Professional rollfilm is coated on 0.125mm/5-mil acetate base. It is available in 120 lengths and is edge numbered 1 to 19.

EXPOSURE RATING

The recommended meter setting for DELTA 3200 Professional is EI 3200/36, but good image quality can also be obtained at meter settings from EI 400/27 to EI 6400/39. It can be used in all types of lighting.

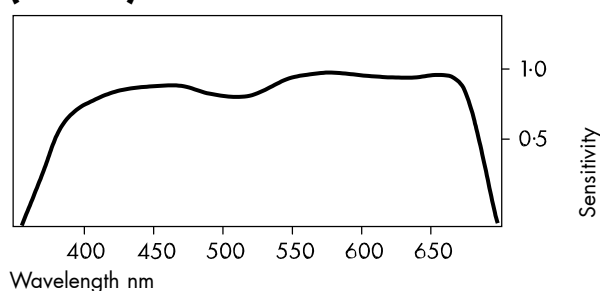
DELTA 3200 Professional is particularly recommended for exposing in the range EI 1600/33 to EI 6400/39. It can be exposed at ratings up to EI 25000/45, but it is important to make test exposures first to ensure the results will be suitable for the intended purpose.

DELTA 3200 Professional has an ISO speed rating of ISO 1000/31° (1000ASA, 31DIN) 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.

It should be noted that the exposure index (EI) range recommended for DELTA 3200 Professional 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)



HANDLING

DELTA 3200 Professional is a very fast film. Always load and unload the camera in subdued light. At airports, request visual inspection of this film, and carry the film in hand luggage.

FILTER FACTORS

DELTA 3200 Professional 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.

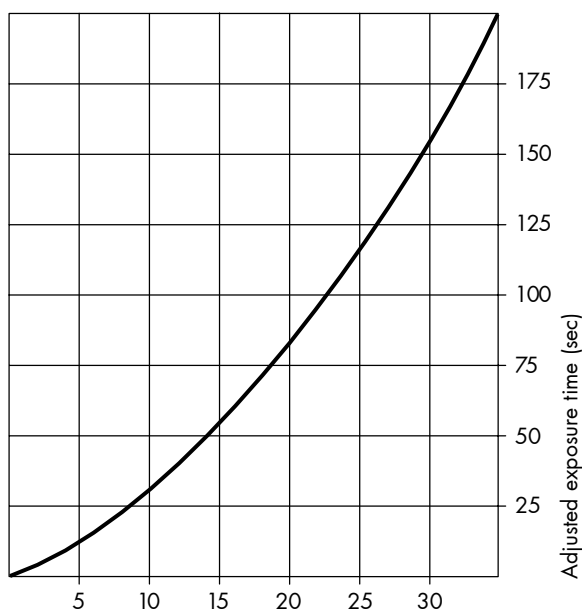
The exposure increase in daylight may vary with the angle of the sun and the time of day. In the late afternoon or the winter months, when daylight contains more red light, green and blue filters may need slightly more exposure than usual.

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.

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MAKING LONG EXPOSURES

For exposures between $\frac{1}{2}$ and $\frac{1}{10\,000}$ second, no adjustments are needed for reciprocity law failure. When exposures longer than $\frac{1}{2}$ second are given, DELTA 3200 Professional, 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 measured time is known.



Measured exposure time (sec)

CHOOSING THE BEST ILFORD DEVELOPER FOR THE JOB

DELTA 3200 Professional will give good results in a wide range of developers when exposed at meter settings up to EI 6400/39. At higher speed ratings, ILFOTEC DD-X and MICROPHEN developers are recommended. Further details are given in the table below.

CHOOSING THE BEST ILFORD DEVELOPER FOR THE JOB**Manual processing (eg spiral tank, dish/tray, deep tank) and rotary processors**

	Liquid	Powder
Best overall image quality at meter setting		
EI 400/27	ILFOTEC DD-X	PERCEPTOL (stock)
EI 800/30	ILFOTEC DD-X	PERCEPTOL (stock)
EI 1600/33	ILFOTEC DD-X	MICROPHEN (stock)
EI 3200/36	ILFOTEC DD-X	MICROPHEN (stock)
EI 6400/39	ILFOTEC DD-X	MICROPHEN (stock)
Finest grain	ILFOTEC DD-X	PERCEPTOL (stock)
Maximum sharpness	ILFOTEC DD-X	MICROPHEN (stock)
Maximum film speed (up to EI 25000/45)	ILFOTEC DD-X	MICROPHEN (stock)
One-shot convenience	ILFOSOL S (1+9) ILFOTEC DD-X	–
Rapid processing	ILFOTEC DD-X	MICROPHEN (stock)
Replenishable	ILFOTEC HC	ID-11

Machine processing

Dip and dunk	ILFOTEC DD ID-11 ILFOTEC HC	Best overall image quality (liquid) and long tank life Best overall image quality (powder) and long tank life Flexible process time, range of dilutions and economy
Short leader	ILFOTEC RT RAPID ILFOTEC HC	Rapid processing, best overall image quality and long tank life Range of dilutions, flexibility and economy
Roller transport	ILFOTEC RT RAPID	Rapid processing

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DEVELOPMENT TIMES

The table gives development times for both manual and machine processing DELTA 3200 Professional. The development times are based on picture testing and are intended as a guide; they should 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.

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. For more contrasty negatives, try the development times for the meter setting above the one used.

Note 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 film and rollfilm

	Dilution	Meter setting (EI)					
		400/27	800/30	1600/33	3200/36	6400/39	12500/42
Spiral tanks and deep tanks (min/20°C/68°F)							
ILFORD developer							
ILFOTEC DD-X*	1+4	6	7	8	9½	12½	17
ILFOTEC HC	1+15	–	–	5	8	13	–
	1+31	6	7½	9	14½	–	–
ILFOTEC LC29	1+9	–	–	5	8	13	–
	1+19	6	7½	9	14½	–	–
ILFOSOL S	1+9	6½	8	10½	13	–	–
MICROPHEN*	stock	6	7	8	9	12	16½
ID-11	stock	7	8	9½	10½	13	17
PERCEPTOL	stock	11	13	15	18	–	–
Non-ILFORD developer							
Agfa Rodinal	1+25	5½	7	9	11	20	–
Kodak D-76	stock	7	8	9½	10½	13	17
Kodak HC-110	A	–	–	5	8	13	–
	B	6	7½	9	14½	–	–
Kodak Microdol-X	stock	10	11½	13	18	–	–
Kodak T-Max	1+4	5½	6½	7½	8½	11	14
Kodak Xtol	stock	5	6	6½	7½	10	12½
Recommended developers*							

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Dilution	35mm film and rollfilm						
	Meter setting (EI)						
	400/27	800/30	1600/33	3200/36	6400/39	12500/42	

Spiral tanks and deep tanks (min/24°C)

ILFORD developer

ILFOTEC DD-X*	1+4	–	5	6	7	9	12
ILFOTEC HC	1+15 1+31	– 5	– 6	– 7	5½ 10½	8½ –	– –
ILFOTEC LC29	1+9 1+19	– 5	– 6	– 7	5½ 10½	8½ –	– –
ILFOSOL S	1+9	5½	6½	8	10½	–	–
MICROPHEN*	stock	–	5	6	7	9½	13½
ID-11	stock	6	7	8	9	11	13½
PERCEPTOL	stock	9½	10½	12	15½	–	–

Non-ILFORD developer

Agfa Rodinal	1+25	–	–	5½	7½	15	–
Kodak D-76	stock	6	7	8	9	11	13½
Kodak HC-110	A B	– 5	– 6	– 7	5½ 10½	8½ –	– –
Kodak Microdol-X	stock	7	8	9	12	–	–
Kodak T-Max	1+4	–	5½	6½	7½	9½	13
Kodak Xtol	stock	–	5½	6	7	9	11

* Recommended developers

Dip and dunk machines (min/24°C/75°F)

ILFOTEC DD	1+4	8	8½	9½	10½	13½	19
Kodak T-Max RS	stock	4	4½	5	6½	8½	10½
Kodak Xtol	stock	8	9	10½	13½	17½	23

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

ILFOTEC RT RAPID	1+1+2 1+1+5	54 95	65 108	73 120	84 153	104 176	–
Kodak DuraFlo RT	stock	54	65	73	84	104	–

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METER SETTINGS OF EI 12500/42 AND ABOVE

When using meter settings of EI 12500/42 and above, it is important to make test exposures first to ensure the results will be suitable for the intended purpose. A guide to development times for meter setting EI 12500/42 is given in the development times tables. For exposures at EI 25000/45, use the guide in the following table.

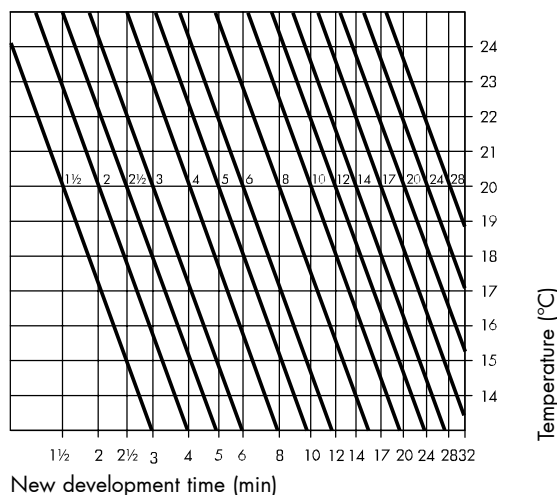
Meter setting EI 25000/45 manual processing

	Dilution	20°C/68°F	24°C/75°F
		min	min
ILFOTEC DD-X 1+4		25	17
MICROPHEN stock		22	17½

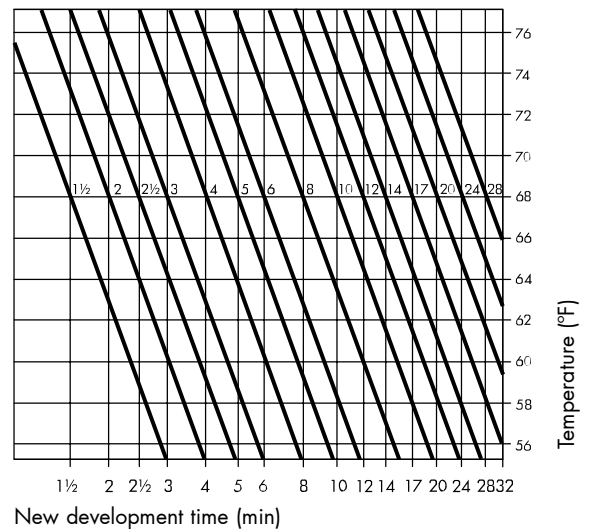
PROCESSING AT DIFFERENT TEMPERATURES

DELTA 3200 Professional film can be processed over a range of temperatures. Development at 20°C/68°F or 24°C/75°F is recommended and the times are given in the development times table. If development is not possible at either 20°C/68°F or 24°C/75°F, the following chart can be used. The chart is based at 20°C/68°F for a general developer, and can be used to give an estimate of development times at temperatures around 20°C/68°F.

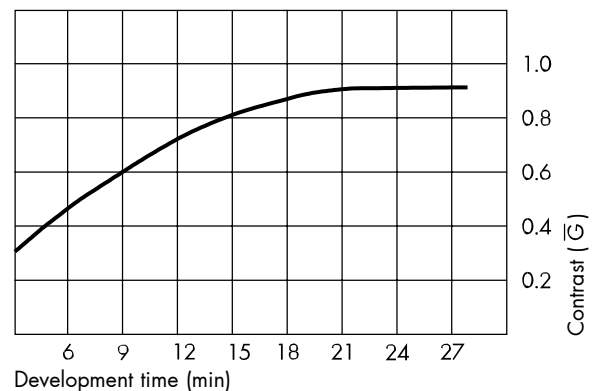
For example, if 12 minutes at 20°C/68°F is recommended, the time at 22°C/71½°F will be 10 minutes and the time at 18°C/64½°F will be 15 minutes.



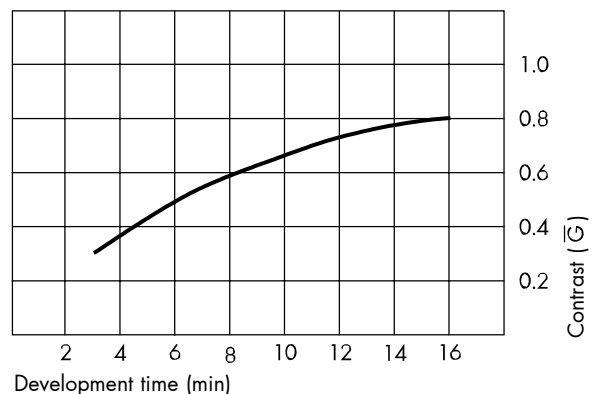
Note The chart can only be a guide because different developers and processing techniques can vary the results.

**CONTRAST-TIME GRAPHS**

The following graphs show the contrast of DELTA 3200 Professional negatives when developed over a range of development times.

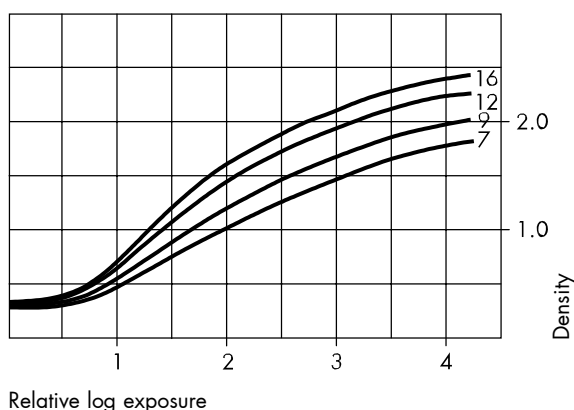


DELTA 3200 Professional film developed in ILFORD ILFOTEC DD-X 1+4 at 20°C/68°F.

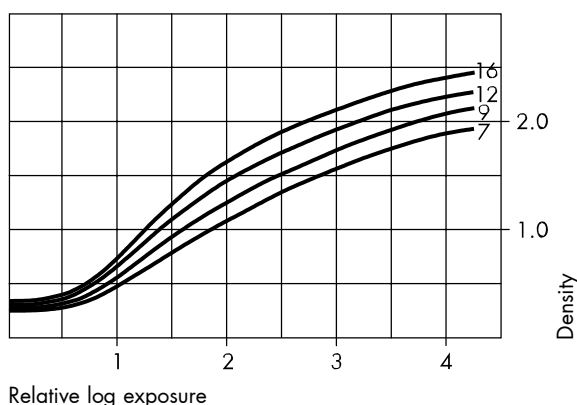


DELTA 3200 Professional film developed in ILFORD MICROPHEN stock at 20°C/68°F.

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CHARACTERISTIC CURVES

DELTA 3200 Professional film developed in ILFORD ILFOTEC DD-X 1+4 for 7, 9, 12 and 16 minutes at 20°C/68°F with intermittent agitation.



DELTA 3200 Professional film developed in ILFORD MICROPHEN stock for 7, 9, 12 and 16 minutes at 20°C/68°F with intermittent agitation.

PROCESSING

DELTA 3200 Professional 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. When fixing DELTA 3200 Professional, however, slightly longer times than used with conventional film are recommended for best results.

Handling

DELTA 3200 Professional must not be handled under any safelighting. Handle the 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.

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) or ILFOSTOP PRO (without indicator dye). ILFOSTOP PRO is 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 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)	15x(135–36)	22x(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 and ILFORD HYPAM liquid fixers and ILFORD ILFOFIX II powder fixer, all are non-hardening fixers.

ILFORD Fixer	ILFORD HYPAM & ILFORD RAPID FIXER	ILFORD 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)	24x(135–36)	24x(135–36)

DELTA 3200 PROFESSIONAL**WASH**

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

For spiral tank use, when a non-hardening fixer has been used, 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.

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 turn HYPAM 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 processing in spiral tanks, dishes/trays, deep tanks, rotary processors, dip and dunk (hanger) machines and short leader card processors, unless the processing temperature is above 30°C (86°F), or poor drying performance is being experienced. To minimise the risk of physical damage a fixer hardener may be needed when using a roller transport film processor.

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

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 10–20ml of hardener per litre of working strength HYPAM used. This higher amount gives 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 ml per litre.

Drying

To avoid drying marks, use a clean squeegee or chamois cloth to wipe DELTA 3200 Professional film before hanging it to dry. Dry DELTA 3200 Professional at 30–40°C/86–104°F in a drying cabinet or at room temperature in a clean dust-free area.

STORAGE

Store DELTA 3200 Professional in a cool (10–20°C/50–68°F), dry place in its original packaging.

Exposed film

Once exposed, process DELTA 3200 Professional as soon as practical. Images on exposed but unprocessed film will not degrade for several months when stored as recommended.

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 or paper (pH6.5–7.5) or inert polyester.

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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