

## FACT SHEET

# 400 DELTA PROFESSIONAL

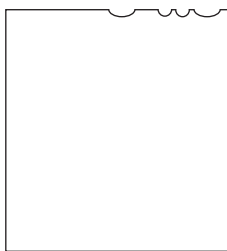
ISO 400/27°, FINE GRAIN, BLACK AND WHITE PROFESSIONAL FILM FOR SUPERB PRINT QUALITY

ILFORD 400 DELTA PROFESSIONAL is a fast, fine grain, black and white film, ideal for pictorial and fine art photography.

400 DELTA Professional 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). 400 DELTA Professional 35mm film is supplied in DX coded cassettes, suitable for all 35mm cameras.

400 DELTA Professional rollfilm is coated on 0.110mm/4-mil clear acetate base with an anti-halation backing which clears during development. It is available in 120 and 220 lengths and is edge numbered 1 to 19 (120) and 1 to 40 (220).

400 DELTA Professional 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

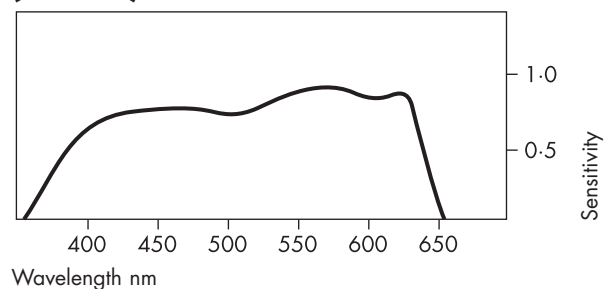
400 DELTA Professional has a speed rating of ISO 400/27° (400ASA, 27DIN, EI 400/27) to daylight. The ISO speed rating was measured using ILFORD ID-11 developer at 20°C/68°F with intermittent agitation in a spiral tank.

Best results are obtained at EI 400/27, but good image quality will also be obtained at meter settings from EI 200/24 to EI 1600/33.

It should be noted that the exposure index (EI) range recommended for 400 DELTA 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)



### FILTER FACTORS

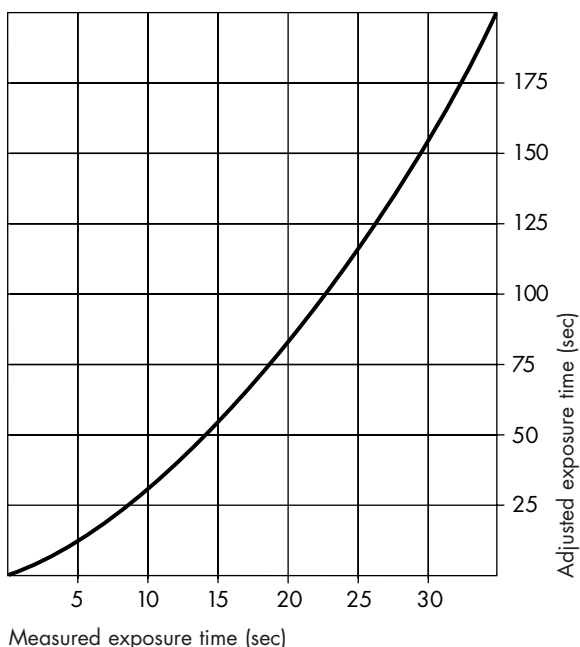
400 DELTA Professional film may be used with all types of filters (eg colour, polarising and neutral density filters) in the usual way. Follow the instructions given by the filter manufacturer.

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.

**MAKING LONG EXPOSURES**

For exposures between  $\frac{1}{2}$  and  $\frac{1}{10000}$  second, no adjustments are needed for reciprocity law failure. When exposures longer than  $\frac{1}{2}$  second are given, 400 DELTA 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.

**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	ILFOTEC DD-X	ID-11 (stock)
Finest grain (EI 400/27)	ILFOTEC DD-X	ID-11 (stock)
Finest grain (EI 200/24)	ILFOTEC DD-X	PERCEPTOL (stock)
Maximum sharpness	ILFOSOL S (1+9)	ID-11 (1+3)
Maximum film speed (EI 1600/33)	ILFOTEC HC DD-X	MICROPHEN (stock)
One-shot convenience	ILFOSOL S (1+9) ILFOTEC DD-X	ID-11 (1+1) MICROPHEN (1+1)
Economy	ILFOTEC LC29 (1+29)	ID-11 (1+3) MICROPHEN (1+3)
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

Some products in this fact sheet might not be available in your country

## DEVELOPMENT TIMES

The table gives development times for both manual and machine processing 400 DELTA Professional. 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 film

Dilution

Meter setting

EI 200/24 EI 400/27 EI 800/30 EI 1600/33

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

ILFORD developer (recommended dilution in bold)

ID-11	<b>stock</b>	<b>6</b>	<b>7</b>	<b>9</b>	<b>12½</b>
	1+1	9	10½	12½	–
	1+3	–	18	–	–
MICROPHEN	<b>stock</b>	–	<b>7</b>	<b>9</b>	<b>12½</b>
	1+1	–	10½	13	18
	1+3	–	17	–	–
PERCEPTOL	stock	10	13	–	–
	<b>1+1</b>	<b>14</b>	<b>18</b>	–	–
	1+3	–	22	–	–
ILFOTEC DD-X	1+4	7	9	11	15
ILFOSOL S	<b>1+9</b>	<b>7</b>	<b>9</b>	<b>13</b>	–
	1+14	11½	14	–	–
ILFOTEC HC	1+15	–	3½	5	8
	<b>1+31</b>	<b>6</b>	<b>7½</b>	<b>10</b>	<b>14</b>
ILFOTEC LC29	1+9	–	3½	5	8
	<b>1+19</b>	<b>6</b>	<b>7½</b>	<b>10</b>	<b>14</b>
	1+29	–	13	–	–
Non-ILFORD developer					
Acufine Acufine	stock	–	5	7	10
Agfa Refinal	stock	–	5	7	–
Agfa Rodinal	1+25	7	9	12½	–
	1+50	12	16½	–	–
Fuji Super Prodol	stock	–	5	7	–
	1+1	–	8	10½	–
Kodak D-76	stock	6	7	9	12½
	1+1	9	10½	12½	–
	1+3	–	18	–	–
Kodak HC-110	A	–	3½	5	8
	B	6	7½	10	14
Kodak Microdol-X	stock	10	13	–	–
	1+3	–	22	–	–
Kodak T-Max	1+4	–	7½	10	14
Paterson Acutol	1+10	8	10	15	–
Tetenal Ultrafin	1+10	–	9	13½	–
	1+20	–	13	–	–
Tetenal Ultrafin Plus	1+4	–	7½	10	–
Tetenal Ultrafin SF	stock	–	5	7	–

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

ILFOTEC DD	1+4	5½	6	7	11
Kodak T-Max RS	stock	–	4½	6	8

### ILFOLAB FP40, roller transport and short leader machines (sec/26°C/78-8°F)

ILFOTEC RT RAPID	stock	–	75	84	115
Kodak Duraflor RT	stock	–	75	84	115

**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.

### Rollfilm & Sheet film

Dilution

Meter setting  
EI 200/24

EI 400/27

EI 800/30

EI 1600/33

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

ILFORD developer (recommended dilution in bold)

ID-11	<b>stock</b>	<b>6½</b>	<b>7½</b>	<b>10</b>	<b>14</b>
	1+1	10	11½	14	–
	1+3	–	20	–	–
MICROPHEN	<b>stock</b>	–	<b>7½</b>	<b>10</b>	<b>14</b>
	1+1	–	11½	14½	20
	1+3	–	18½	–	–
PERCEPTOL	stock	11	14½	–	–
	<b>1+1</b>	<b>15½</b>	<b>20</b>	–	–
	1+3	–	24	–	–
ILFOTEC DD-X	1+4	7½	10	12	17
ILFOSOL S	<b>1+9</b>	<b>7½</b>	<b>10</b>	<b>14½</b>	–
	1+14	12½	15½	–	–
ILFOTEC HC	1+15	–	4	5½	9
	<b>1+31</b>	<b>6½</b>	<b>8½</b>	<b>11</b>	<b>15½</b>
ILFOTEC LC29	1+9	–	4	5½	9
	<b>1+19</b>	<b>6½</b>	<b>8½</b>	<b>11</b>	<b>15½</b>
	1+29	–	14½	–	–
Non-ILFORD developer					
Acufine Acufine	stock	–	5½	7½	11
Agfa Refinal	stock	–	5½	7½	–
Agfa Rodinal	1+25	7½	10	14	–
	1+50	13	18	–	–
Fuji Super Prodol	stock	–	5½	7½	–
	1+1	–	9	11½	–
Kodak D-76	stock	6½	7½	10	14
	1+1	10	11½	14	–
	1+3	–	20	–	–
Kodak HC-110	A	–	4	5½	9
	B	6½	8½	11	15½
Kodak Microdol-X	stock	11	14½	–	–
	1+3	–	24	–	–
Kodak T-Max	1+4	–	8½	11	15½
Paterson Acutol	1+10	9	11	16½	–
Tetenal Ultrafin	1+10	–	10	15	–
	1+20	–	14½	–	–
Tetenal Ultrafin Plus	1+4	–	8½	11	–
Tetenal Ultrafin SF	stock	–	5½	7½	–

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

ILFOTEC DD	1+4	6	6½	7½	12
Kodak T-Max RS	stock	–	6½	7½	10

### ILFOLAB FP40, roller transport and short leader machines (sec/26°C/78-8°F)

ILFOTEC RT RAPID	stock	–	84	95	127
Kodak Duraflo RT	stock	–	84	95	127

**DEVELOPMENT TIMES**

If 400 DELTA Professional has been inadvertently exposed at settings below EI 200/24 or above EI 1600/33, 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.

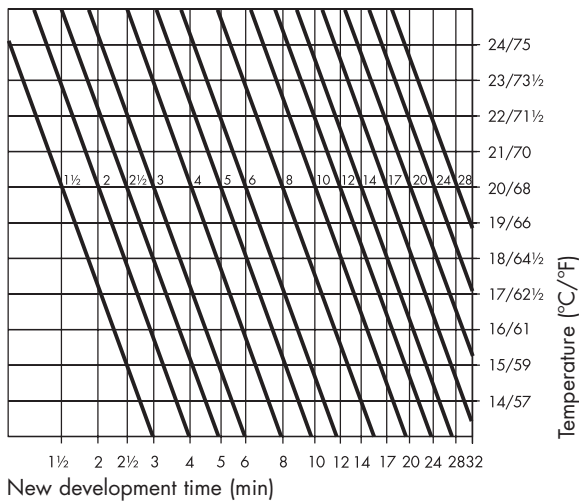
**Manual processing (min/20°C/68°F) - accidental exposure only**

	Dilution	Meter setting	
		EI 100/21 and below	EI 3200/36 and above
MICROPHEN	stock	–	17½
PERCEPTOL	stock	8	–

**PROCESSING AT DIFFERENT TEMPERATURES**

400 DELTA Professional film can be processed over a range of temperatures. A guide to development times at temperatures other than 20°C/68°F is given below.

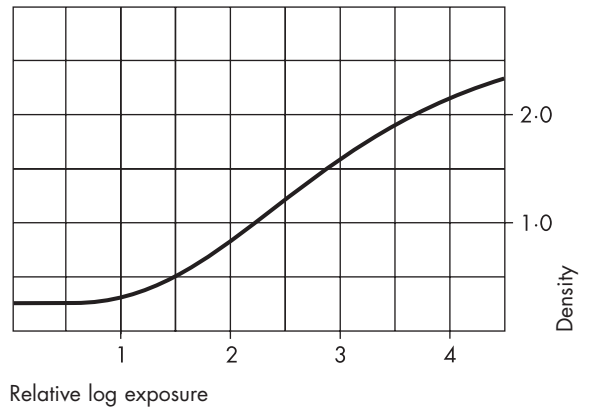
For example, if 4 minutes at 20°C/68°F is recommended, the time at 23°C/73½°F will be 3 minutes and the time at 16°C/61°F will be 6 minutes.



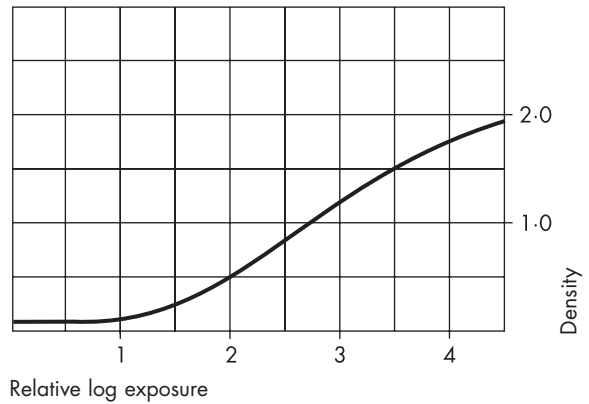
**Note** Fahrenheit temperatures are given to the nearest half degree.

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

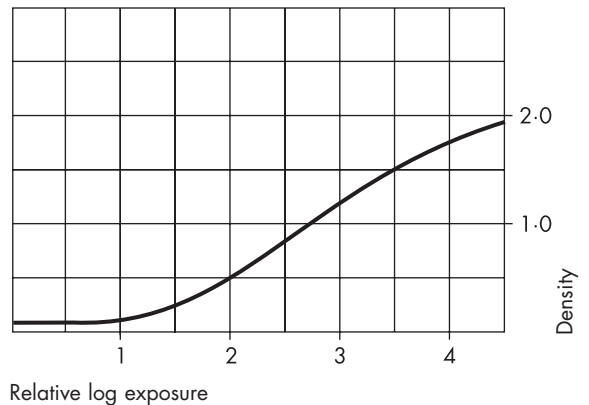
**CHARACTERISTIC CURVES**



400 DELTA Professional 35mm film developed in ILFORD ID-11 stock for 7 minutes at 20°C/68°F with intermittent agitation.



400 DELTA Professional rollfilm developed in ILFORD ID-11 stock for 7½ minutes at 20°C/68°F with intermittent agitation.



400 DELTA Professional sheet film developed in ILFORD ID-11 stock for 7½ minutes at 20°C/68°F with intermittent agitation.

## PROCESSING

400 DELTA 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 400 DELTA Professional, however, slightly longer times than used with conventional film are recommended for best results.

## Safelight recommendations

Handle 400 DELTA Professional film in total darkness. For very brief inspections during processing, use the ILFORD 908 (very dark green) safelight filter, with a 15W bulb, fitted in a darkroom lamp (such as the ILFORD DL10 or DL20). Do not allow direct lighting from the safelight to fall on the film.

## 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. Continuous agitation is recommended in dishes/trays (by rocking the dish/tray or by interleaving the sheets). Otherwise, follow the recommendations given by the processing equipment manufacturer.

## Fixation

After development, rinse the film in water or an acid stop bath (ILFORD ILFOSTOP or ILFOSTOP PRO) and fix in ILFORD HYPAM or ILFORD UNIVERSAL RAPID fixer (1+4) for 3–5 minutes at 20°C/68°F. A hardener is recommended only when processing at high temperatures (above 30°C/86°F) or in a roller transport processor.

## Washing

Where a non-hardening fixer, such as HYPAM or UNIVERSAL RAPID, has been used, wash the film in running water for 5–10 minutes at a temperature within 5°C/9°F of the processing 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.

- 1 Process the film in a spiral tank.
- 2 Fix it using HYPAM or UNIVERSAL RAPID fixer.
- 3 After fixation, fill the tank with water at the same temperature as the processing solutions, and invert it five times.
- 4 Drain the water away and refill. Invert the tank ten times.

5 Drain and refill it for the third time and invert the tank twenty times. Drain the water away.

A final rinse in water to which ILFORD ILFOTOL wetting agent have been added (1+200) will aid rapid and uniform drying.

## Drying

To avoid drying marks, use a clean squeegee or chamois cloth to wipe 400 DELTA Professional film before hanging it to dry. Dry 400 DELTA Professional at 30–40°C/86–104°F in a drying cabinet or at room temperature in a clean dust-free area.

## STORAGE

Store 400 DELTA Professional in a cool (10–20°C/50–68°F), dry place in its original packaging.

## Exposed film

Once exposed, process 400 DELTA 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, 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.