

TECHNICAL INFORMATION

100 DELTA PROFESSIONAL

ISO 100/21°; FINE GRAIN, BLACK AND WHITE PROFESSIONAL FILM
FOR SUPERB PRINT QUALITY



Photo by Wendy Erickson ©1994

ILFORD

100 DELTA PROFESSIONAL

Fine Grain Black and White Film

1 DESCRIPTION & USE

ILFORD 100 DELTA PROFESSIONAL is a medium speed, black and white film, ideal for pictorial and fine art photography. The new, professional version of 100 DELTA, in 35mm, can be processed in a wider variety of developers. It is also less sensitive to changes in development, offering greater process control. When given standard development it has a speed rating of ISO 100/21° to daylight.

Prints made from 100 DELTA PROFESSIONAL film exposed at EI 100/21 have extremely fine grain and outstanding sharpness. In fact, in the hands of a skilled specialist, who will pay careful attention to exposure and processing, prints from 100 DELTA PROFESSIONAL negatives can be exceptional.

100 DELTA PROFESSIONAL though, is not just for specialists and is more than an ISO 100/21° film. Its exposure latitude allows good quality results to be obtained over the exposure range EI 50/18 to EI 200/24.

100 DELTA PROFESSIONAL is compatible with all major processing systems and can be processed in all popular developers.

1.1 35mm FILM

100 DELTA PROFESSIONAL 35mm film is supplied in DX coded cassettes, so the film speed of ISO 100/21° is set automatically on most cameras. These cassettes are very strong and have the end caps firmly fixed to the body. This ensures the caps remain in position during rough handling.

The combination of the tangential style cassette and the low friction characteristics of the film is much appreciated by motor drive or autowind users, as the film is easily advanced, thus saving battery wear.

100 DELTA PROFESSIONAL 35mm film has a neutral base tint which enables easy print contrast assessment on the light box.

100 DELTA PROFESSIONAL 35mm film is available in 24 or 36 exposure DX coded cassettes or in bulk film lengths of 100 feet. 100 DELTA PROFESSIONAL 35mm film is coated on 0.125mm ($\frac{5}{1000}$ inch) acetate base.

1.2 ROLL FILM

100 DELTA PROFESSIONAL roll film is coated on 0.110mm ($\frac{4}{1000}$ inch) clear acetate base which has an antihalation backing that clears during development. 100 DELTA PROFESSIONAL roll film is available in 120 length and is edge numbered 1 to 19 to ensure all formats can be identified, whatever camera format is being used.

The backing paper has a white outer surface for easy frame identification. The portion of the backing paper visible after exposure is black with white printing for quick identification of exposed films.

1.3 SHEET FILM

100 DELTA PROFESSIONAL sheet film is available in a wide range of standard sizes. It is coated on 0.180mm ($\frac{7}{1000}$ inch) polyester base, offering rigidity and dimensional stability. This makes it ideally suitable for machine processing in automatic processors without the need for leaders. The base has an antihalation backing which clears during processing.

The short side of 100 DELTA PROFESSIONAL sheet film is notched to indicate the emulsion surface and film type. The emulsion faces the user when the film is held in the position shown. The notch code above indicates that the film is 100 DELTA PROFESSIONAL.



Both surfaces of 100 DELTA PROFESSIONAL accept commonly used retouching media and are designed to resist surface roller marks when machine processing.

In addition to general purpose photography, 100 DELTA PROFESSIONAL sheet film is ideal for copying and internegative work.

2. EXPOSURE DETAILS

2.1 EXPOSURE RATING

100 DELTA PROFESSIONAL has a speed rating of ISO 100/21° (100ASA, 21 DIN, EI 100/21) to daylight and is recommended for pictorial and fine art photography in all types of lighting. While a meter setting of EI 100/21 is recommended for optimum results, high quality results are also obtained when 100 DELTA PROFESSIONAL is exposed over the range EI 50/18 to EI 200/24.

It should be noted that the exposure index (EI) recommended for 100 DELTA PROFESSIONAL is based on a practical evaluation of film speed and is not based on foot speed, as is the ISO standard.

2.2 FILTER FACTORS

100 DELTA PROFESSIONAL film can be used with all types of filters (e.g., color, polarizing and neutral density filters) in the usual way.

The table gives a practical GUIDE to the increase in exposure needed when using the filters listed. 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 the daylight contains more red light, green and blue filters may need slightly more exposure than usual. The exposure increases for tungsten light are based on an average tungsten source which has a color temperature of 3200K.

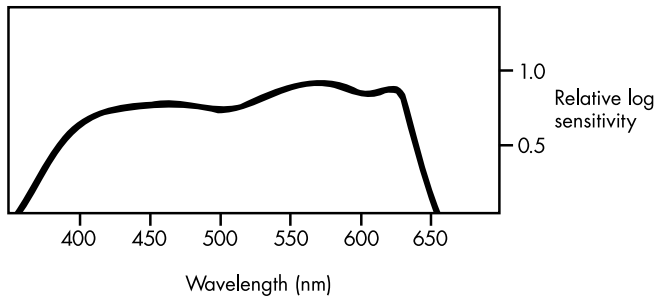
Cameras with through-the-lens metering will usually adjust the exposure automatically when using filters. With some automatic exposure cameras, the correction given for deep red and orange filters can produce negatives under exposed

by as much as 1½ stops. To check for this, take two readings of the same subject, one with and one without a filter on the lens. Compare the difference between the two with the filter manufacturer's recommended increase in the exposure. Where a meter is causing under exposure, either adjust the speed rating or, if possible, switch to manual operation.

The factors are intensity scale factors, but in most cases exposures can be increased by using either a larger aperture or a slower shutter speed. Multiply a metered exposure by the filter factor to approximate the new setting.

Kodak Wratten Filter	Daylight Factor	Tungsten Factor
Yellow (#8)	1.5	1.2
Deep Yellow (#15)	2.0	1.5
Yellowish Green (#11)	3.0	3.0
Orange (#21)	2.3	2.0
Deep Orange (#22)	5.0	2.5
Tricolor Red (#25)	8.0	4.0
Tricolor Blue (#47)	8.0	25.0
Tricolor Green (#58)	6.0	6.0
Neutral Density (.30)	2.0	2.0

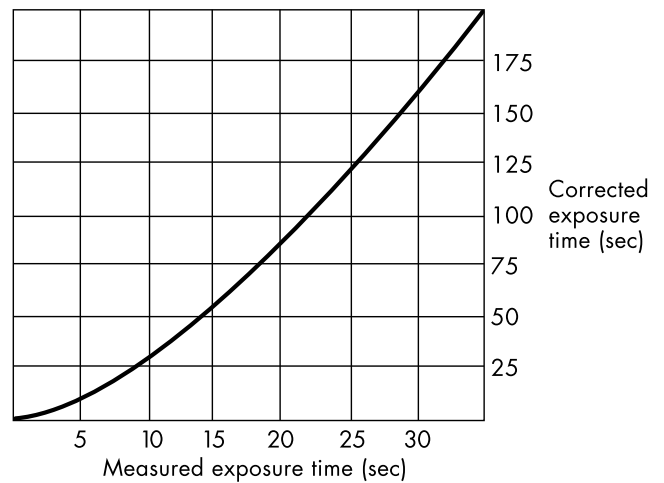
2.3 SPECTRAL SENSITIVITY



2.4 RECIPROCITY CHARACTERISTICS

Most films, including 100 DELTA PROFESSIONAL, are designed to be used over a wide range of exposures. This range covers most normal photography, including exposure by electronic flash. Thus, for exposures between ½ and 1/10,000 second, no corrections are needed for reciprocity law failure.

For exposures longer than ½ second, 100 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.



3 PROCESSING OPTIONS

100 DELTA PROFESSIONAL is a versatile film and may be exposed and developed to suit a wide range of requirements. This section outlines how this can best be done.

3.1 DEVELOPERS

The versatility of 100 DELTA PROFESSIONAL can be exploited by selecting the best ILFORD developer for the job. The table is a guide to choosing the ILFORD developer for 100 DELTA PROFESSIONAL that is most suited to individual requirements.

MANUAL PROCESSING (e.g., Spiral Tank, Tray, Deep Tank)

Requirement	Liquid	Powder
Best Overall Image Quality	ILFOTEC HC (1+31)	ID-11 (Stock)
Finest Grain (EI 50/18)	ILFOSOL-S (1+9)	PERCEPTOL (Stock)
Finest Grain (EI 100/21)	ILFOSOL-S (1+14)	PERCEPTOL (1+1)
Maximum Sharpness	ILFOTEC HC (1+31)	ID-11 (1+3)
Maximum Film Speed (EI 200/24)	—	MICROPHEN (Stock)
One-Shot Convenience	ILFOSOL-S (1+14)	ID-11 (1+3) MICROPHEN (1+3)
Economy	ILFOTEC HC (1+31)	ID-11 (1+3) MICROPHEN (1+3)

MACHINE PROCESSING

Dip and Dunk	ILFOTEC DD	Best overall image quality (liquid)
	ILFOTEC HC	Flexible process time, range of dilutions and economy
Leader Card	ILFOTEC RT RAPID	Rapid processing, best overall image quality and long tank life
	ILFOTEC HC	Range of dilutions, flexibility and economy
Roller Transport	ILFOTEC RT RAPID	Rapid processing, best overall image quality
	ILFOTEC HC (1+11)	Economy

4 PROCESSING METHODS

100 DELTA PROFESSIONAL can be processed in all types of processing equipment including spiral tanks, deep tanks and automatic processors. This new technology film will not cause premature exhaustion of the developer, so standard capacity figures and replenishment rates can be maintained. When fixing 100 DELTA PROFESSIONAL, however, slightly longer times than usual are recommended for best results.

4.1 SAFELIGHT RECOMMENDATIONS

Handle 100 DELTA PROFESSIONAL film in total darkness. For very brief inspections during processing, use the ILFORD 908 (very dark green) or Kodak 3 safelight filter, with a 15W bulb, fitted in a darkroom lamp. Do not allow direct lighting from the safelight to fall on the film.

When processing 100 DELTA PROFESSIONAL film by inspection, the safest way is to use infrared illumination in the darkroom, with infrared goggles to see the film. This method ensures the film cannot be fogged and makes it easy to see the image.

4.2 SPIRAL TANK PROCESSING

The recommended agitation for spiral tank processing with ILFORD chemicals is to invert the tank four times during the first 10 seconds and again for 10 seconds (four inversions) at the start of every further minute. Use this method of agitation for both developing and fixing. At the end of each agitation sequence, tap the tank firmly to dislodge any air bubbles.

4.3 ROTARY PROCESSORS

Rotary processors, such as those made by Jobo, have very similar processing conditions to spiral tank processing by hand, except they process with small amounts of solution and can be pre-programmed. Follow any guidance given by the processor manufacturer when adjusting processing times for these types of processors. Standard development times are given in section 5.2 Development Times; these may need reducing by up to 15% for use in rotary processors without a pre-rinse because of the continuous agitation given in these processors. Alternatively, if using a pre-rinse, use the development times for spiral tank processing as a guide.

4.4 MACHINE PROCESSING

100 DELTA PROFESSIONAL can be processed in all types of general purpose film processors, including dip and dunk, short leader and roller transport processors—see the developer recommendations in section 3.1 Developers.

After development, fix 100 DELTA PROFESSIONAL in ILFORD UNIVERSAL Rapid fixer (1+3). When roller transport processing, add one part ILFORD FIX HARDENER to every 40 parts working strength UNIVERSAL Rapid fixer. Hardener protects the film during the remainder of the roller transport processing sequence.

5 DEVELOPMENT TIMES

The tables give development times for both manual and machine processing 100 DELTA PROFESSIONAL film. These times will produce negatives of average contrast suitable for printing in all enlargers. The development times are intended as a GUIDE ONLY and may be altered if a different result is required.

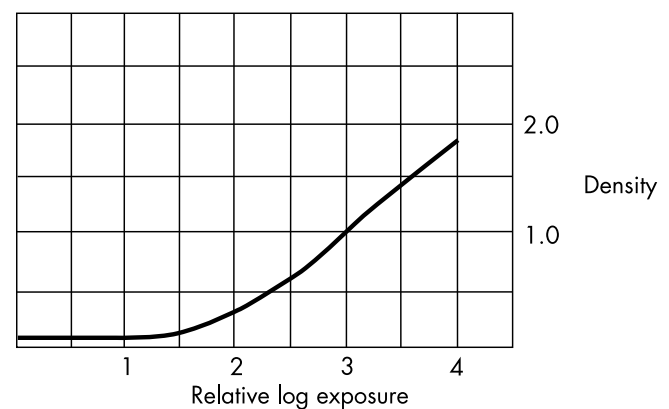
To use the tables, determine the meter setting used, then choose the developer and dilution, and read off the development time. This time has been found to give the best quality with that meter setting in that developer. This simplified approach to development times with 100 DELTA PROFESSIONAL means there is no need to adjust the meter setting to suit the choice of developer.

For manual processing, these times are based on intermittent agitation (see section 4.2). When continuous agitation is used for manual processing—as in a tray or with some types of developing tanks—reduce these times by up to 15%.

Note: The contrast level obtained using these development times is between the “normal” and “high” contrast levels that used to be recommended for use with condenser or diffuser enlargers respectively. This approach is no longer necessary, considering the enlarger types that are popular today.

5.1 CHARACTERISTIC CURVE

100 DELTA PROFESSIONAL developed in ILFORD ID-11 stock for 8½ minutes at 68°F (20°C) with intermittent agitation.



5.2 DEVELOPMENT TIMES

35mm, ROLL AND SHEET FILM
SPIRAL TANK, DEEP TANK, AND ROTARY PROCESSORS (MIN./68°F/20°C)

ILFORD Developer	Dilution	Meter Setting		
		EI 50/80	EI 100/21	EI 200/24
ILFOSOL-S	1+9	4.5**	6	—
	1+14	6.5	10	—
ILFOTEC HC	1+31	5	6	8
	1+47	5.5	7.5	10
ID-11	Stock	7	8.5	10.5
	1+1	10	11	13
	1+3	15	20	—
MICROPHEN	Stock	—	6.5	8
	1+1	—	10	14
	1+3	—	14	20
PERCEPTOL	Stock	12	15	—
	1+1	13	17	—
	1+3	16	22	—

Non-ILFORD Developer	Dilution	Meter Setting		
		EI 50/18	EI 100/21	EI 200/24
Kodak D76	Stock	7	9	11
	1+1	9.5	12	14
	1+3	14	22	—
Kodak HC-110	B	5	6	8
	E	5.5	7.5	10
Kodak T-Max	1+4	6	7	8
Kodak Microdol-X	Stock	12	15	—
	1+3	16	22	—
Acufine	Stock	—	—	5.5
Agfa Rodinal	1+25	7	9	—
	1+50	10	14	—

DIP AND DUNK MACHINES (Min./75.2°F/24°C)

Developer	Dilution	Meter Setting		
		EI 50/18	EI 100/21	EI 200/24
ILFOTEC DD	1+4	5.5	7	7
ILFOTEC HC	1+31 (68°F)	5	6	8
Kodak T-Max RS	Stock	5	6	8

**Not recommended due to the risk of uneven development.

ROLLER TRANSPORT, LEADER CARD MACHINES (Sec.)

Developer	Dilution	Meter Setting		
		EI 50/18	EI 100/21	EI 200/24
ILFOTEC RT RAPID	Standard (78.8°F)	—	50	50
	Modified	—	50	55
ILFOTEC HC	1+11 (75.2°F)	60	76	119
Kodak Duraflo	Stock (80.6°F)	—	45	50

5.3 METER SETTINGS BELOW EI 25/15 OR ABOVE EI 400/27

If 100 DELTA PROFESSIONAL has been exposed at a meter setting slower than EI 25/15 or faster than EI 400/27, the following guide will ensure that usable negatives are obtained. Obviously, the quality of negatives processed in this way will not be as high as conventionally processed ones.

MANUAL PROCESSING (Min./68°F/20°C)

ILFORD Developer	Dilution	Meter Setting	
		EI 25/15	EI 400/27
PERCEPTOL	Stock	9	*
MICROPHEN	Stock	*	10

*Not Recommended

For users who regularly like to shoot films slower than ISO 100/21, the recommended ILFORD film is ILFORD PAN F Plus (ISO 50/18°).

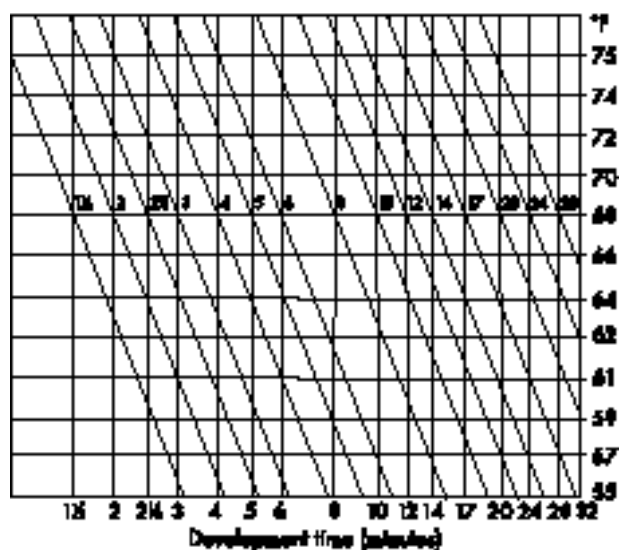
Also available is ILFORD XP2 (ISO 400/27°), a unique black and white film which can be exposed over meter settings from EI 100/21 to EI 800/30 on the same roll of film. It has very fine grain and must be processed through standard C-41 type color negative chemicals.

5.4 PROCESSING AT DIFFERENT TEMPERATURES

100 DELTA PROFESSIONAL film can be processed over a range of temperatures. Development times at temperatures other than 68°F may be calculated from the chart on the next page.

1. Look up the development time at 68°F in the tables in section 5.2.
2. Find this time on the 68°F line—see the figures in the middle of the chart.
3. Follow the diagonal line for this time to where it cuts the horizontal line for the new temperature.
4. Draw a line straight down from this point and read off the approximate new development time on the base of the chart.

For example, if 4 minutes at 68°F is recommended, the time at 74°F will be about 3 minutes and the time at 61°F will be 6 minutes.



5.5 FIXING

Use the standard ILFORD recommendations for agitation when fixing 100 DELTA PROFESSIONAL—see sections 4.2 and 4.3. For best results, it is advisable to give 100 DELTA PROFESSIONAL slightly longer fixing times than usual.

After development, rinse the film in water and fix in ILFORD UNIVERSAL Rapid fixer (1+3) 3–5 minutes at 68°F. If ILFORD FIX HARDENER* is added to the fixer, fix for 5 minutes at 68°F. A hardener is recommended only when processing at high temperatures (above 86°F) or in a roller transport processor.

*ILFORD FIX HARDENER *CAN NOT* be used with ILFORD MULTIGRADE or 2000 RT Fixers.

5.6 WASHING

When a non-hardening fixer such as UNIVERSAL Rapid has been used, wash the film in running water for 5–10 minutes at a temperature within $\pm 10^\circ\text{F}$ of the processing temperature.

For spiral tank use when a non-hardening fixer has been used, the following method of washing is faster, uses less water yet still gives negatives of archival permanence.

1. Process the film in a spiral tank.
2. Fix it using ILFORD UNIVERSAL Rapid fixer.
3. After fixing, 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.

When a hardening fixer has been used, wash the film in running water for 15–20 minutes at a temperature within $\pm 10^\circ\text{F}$ of the processing temperature. Use of a hardening fixer makes the film more difficult to wash and is therefore not recommended.

A final rinse in water to which ILFOTOL Wetting Agent (1+200) has been added will aid rapid and uniform drying.

5.7 DRYING

To avoid drying marks, use a squeegee or chamois cloth to wipe 100 DELTA PROFESSIONAL film before hanging it to dry. Dry 100 DELTA PROFESSIONAL at 86–104°F in a drying cabinet or at room temperature in a clean, dust free area.

6 CONTRAST-TIME CURVES

For normal use at EI 100/21, develop 100 DELTA PROFESSIONAL film according to the development times given in the table in section 5.2 Development Times. The development times for a meter setting of EI 100/21 correspond to zero contrast change on the contrast-time curves.

For subjects with an unusually large or small brightness range, and also to fine tune contrast to suit individual requirements, it is possible to vary the development time to obtain the type of negatives required. As a guide, try changing contrast in steps of 5%.

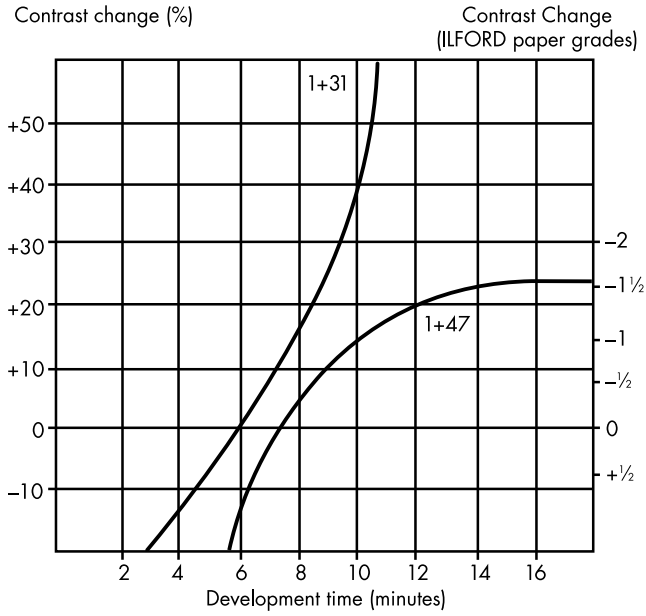
Note: In general, the best image quality is always obtained when the film is processed according to the recommendations given in sections 4 and 5, and printed on the appropriate grade of paper for the resulting negatives.

The scale on the right hand side of the contrast-time curves gives the contrast changes in ILFORD printing paper contrast grades.

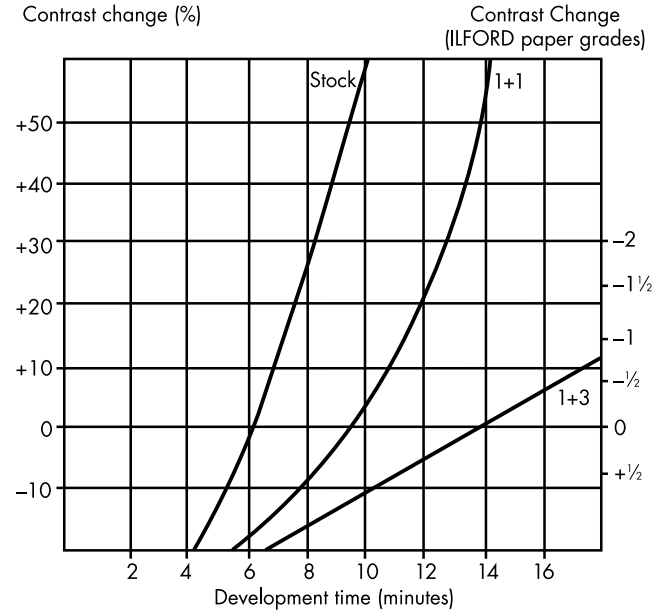
For example, if your negatives normally lie between paper grades 2 and 3, you may wish to increase the film development time, and so increase the contrast of the negatives, so they print on grade 2.

In such a case with ILFOTEC HC (1+31) developer, for example, instead of giving a development time of 6 minutes, read off the new development time of approximately 7 minutes where the $-\frac{1}{2}$ paper grade meets the contrast-time curve. Alternatively, use one of the ILFORD MULTIGRADE papers which gives $\frac{1}{2}$ steps of contrast.

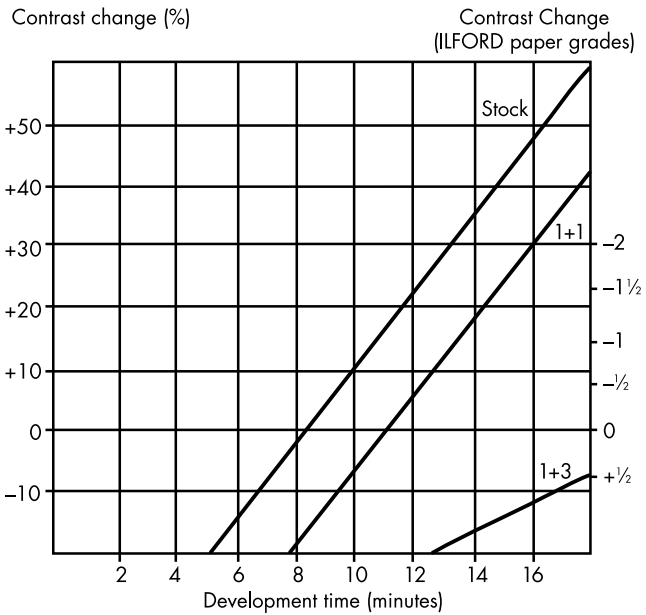
6.1 ILFOTEC HC



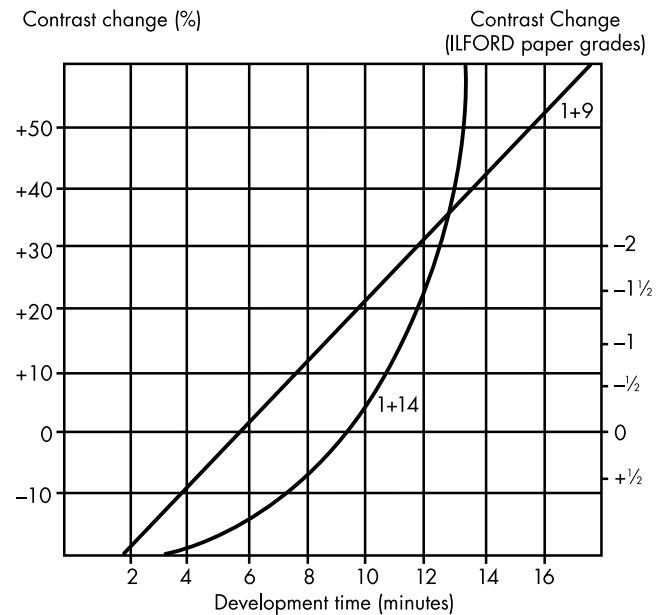
6.3 MICROPHEN



6.2 ID-11



6.4 ILFOSOL-S



7 STORAGE

In common with all film, store unexposed 100 DELTA PROFESSIONAL in a cool, dry place in its original packaging. Never leave film in a hot place, such as near a radiator or in the glove compartment of a car. Similarly, never leave film in strong sunlight, such as near a window.

7.1 STORAGE OF EXPOSED FILM

As with any film, once exposed, process 100 DELTA PROFESSIONAL as soon as possible. Images on exposed but unprocessed film will not degrade during normal working periods, that is, up to one month when stored as recommended.

7.2 NEGATIVE STORAGE

Store processed negatives in a cool, dry place, in the dark. Suitable storage sleeves include those made of cellulose triacetate, Mylar or paper (pH6.5–7.5) or inert polyester. Certain other plastics, PVC in particular, are not recommended for negative storage as the plasticiser used may affect the film and cause it to stick to the negative sleeves.

8 PRINT MAKING

100 DELTA PROFESSIONAL gives negatives with superb image quality which will ensure excellent quality prints, even from subjects with a wide brightness range. 100 DELTA PROFESSIONAL is designed for use with all papers to give a full range of tones including excellent highlight and shadow detail.

For best results, the ILFORD range of MULTIGRADE variable contrast papers, and graded papers such as ILFOSPEED RC DELUXE and ILFOBROM GALERIE FB are recommended. Additionally, the ILFORD MULTIGRADE 500 exposing system replaces the standard lamphouse on most professional enlargers and ensures fast and efficient printing on MULTIGRADE papers.

The development times in section 5.2 give negatives which are suitable for printing in all enlargers. These times, however, are only a guide and may be altered to suit individual printing requirements. Some guidance on altering the times is given in the contrast-time curves in section 6.

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

Printed in U.S.A.

ILFORD PHOTO
West 70 Century Road
P.O. Box 288
Paramus, New Jersey 07653
(201) 265-6000

ILFORD ANITEC (CANADA) LIMITED
2751 John Street
Markham, Ontario
Canada L3R 2Y8
(905) 940-4455

Names printed in capitals are ILFORD trademarks.
Kodak and T-Max are trademarks of
Eastman Kodak Company.

Catalog #14542
KD 10M 6/96