

TECHNICAL INFORMATION

PAN F

FINE GRAIN BLACK AND WHITE 35mm FILM

ILFORD

1 Description and use

PAN F is an extremely fine grain black and white film. When given standard development it has a rating of 50ASA 18DIN to daylight. In addition to its ultra-fine grain, PAN F has outstanding resolution, sharpness and edge contrast. These characteristics enable the very highest image quality to be achieved and make PAN F the natural film choice where fine detail and lack of grain are more important than film speed. PAN F has good exposure latitude and gives prints with exceptional brightness and tonal range. It is also an ideal film for reversal processing. Warm tone transparencies are produced on reversal.

PAN F 35 mm film has an attractive base tint which enables easy print contrast assessment on the light box. It also has bold frame numbering for easy negative identification.

2 Filter factors

The factors quoted below give a practical guide to the increase in exposure necessary when using the filters listed. Daylight factors may vary with angle of the sun and the time of day. In the late afternoon, or in the winter months when the daylight contains more red light, the factors for green and blue filters may have to be slightly increased. Factors for tungsten light are based on an average tungsten source which has a colour temperature of 2850°K. The filter factors are intensity scale factors, but for most purposes exposures can be increased by either using a larger aperture or a slower shutter speed.

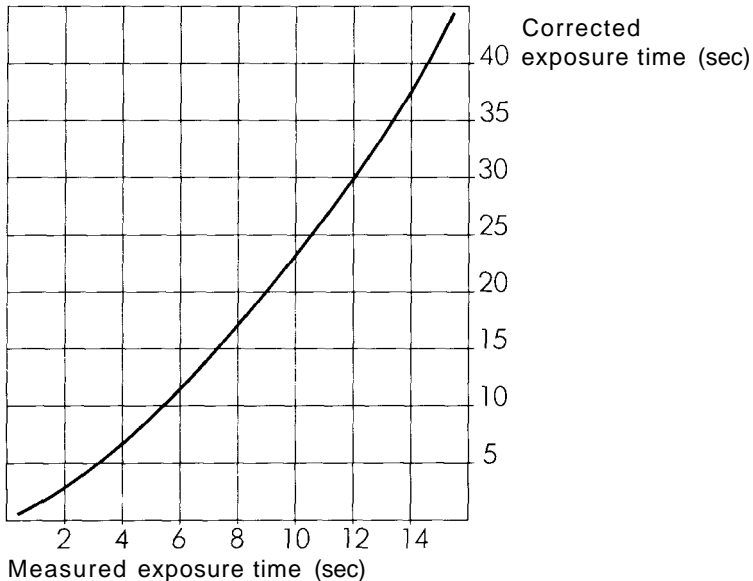
	Daylight	Tungsten
104 Alpha (yellow)	1 ¹ / ₂	1 ¹ / ₄
109 Delta (deep yellow)	2	1 ¹ / ₂
202 Micro 5 (deep orange)	5	2 ¹ / ₄
402 Gamma (yellow-green)	3 ¹ / ₂	4
403 HW (bluish-green)	—	3 ¹ / ₂
204 Tricolour red	6	4
304 Tricolour blue	7	13
404 Tricolour green	6	6

3 Reciprocity characteristics

There is no need to compensate for reciprocity characteristics when PAN F is given exposure times between $\frac{1}{2}$ and $\frac{1}{1,000}$ second. Exposure times which are longer than $\frac{1}{2}$ second must be adjusted to allow for reciprocity failure.

The graph below can be used to calculate the new exposure times allowing for reciprocity characteristics. The times on the horizontal axis represent the estimated exposure times, the vertical axis gives the corrected exposure times.

3.1 Reciprocity curve



For extremely short exposures, such as $\frac{1}{10,000}$ second, the lens aperture should be opened by $\frac{1}{2}$ stop over the indicated setting.

4 Safelight recommendation

PAN F should be handled and developed in total darkness. An ILFORD 908 (very dark green) safelight may, however, be used provided that no direct light is allowed to fall on the film.

5 Exposure/development technique

PAN F is the natural choice for ultra-fine grain and outstanding resolution. While having a standard speed rating of 50ASA 18DIN, it may be exposed and developed to suit a wide range of requirements. This section outlines best how this can be done.

5.1 Printing contrast

Enlargers fall into two main groups: condenser and diffuser. As the former gives contrasty results and the latter softer, final negative contrast needs to be determined before processing. For negatives to be printed in condenser enlargers on a mid-contrast grade of paper (ie ILFORD grade 2 or 3), 'normal' contrast is required. For those printed in diffuser enlargers on a mid-contrast paper, 'high' contrast is required. The tables given below show the development times required to process PAN F to both normal and high contrast.

Film processed for printing in diffuser enlargers should be given a higher speed rating than that processed for use in condenser enlargers — see section 5.3.

5.2 Subject contrast

Having established the contrast required of the negative at the printing stage it is sometimes necessary to further adjust processing to suit the subject brightness range of the scene being photographed. For example, in very bright sunlight it could be beneficial to increase exposure by say $\frac{1}{2}$ stop and reduce development. This would slightly compress the negative density range but maintain the exposure level. Conversely, when the subject brightness range is low, it is desirable to increase development. No change in exposure is usually necessary. The contrast-time graphs on the following pages offer some guidance in selecting the modified development required.

5.3 Film speed

The versatility of PAN F can be exploited by selecting the right ILFORD developer for the job. For best all-round results use ILFORD ID-11. For fine grain and one-shot convenience use ILFOSOL 2. For finest grain but some loss of film speed develop PAN F in ILFORD PERCEPTOL. For an increase in film speed develop PAN F in ILFORD MICROPHEN.

PAN F may also be machine processed to 50ASA 18DIN with ILFORD ILFONEG film developer/replenisher.

The meter setting recommended for each film/developer combination is quoted below. These have been derived from negatives processed to normal and high contrast.

	PERCEPTOL	ILFOSOL 2	ID-11	MICROPHEN	ILFONEG
Normal contrast					
ASA	25	50	50	64	50
DIN	15	18	18	19	18
High contrast					
ASA	32	64	80	100	80
DIN	16	19	20	21	20

While the above ASA/DIN recommendations relate to daylight, they may be used as a guide when shooting under artificial lighting conditions.

6 Development

The following table gives development times in minutes for processing in a spiral tank at 20°C with agitation for the first 10 seconds of development, and then for 10 seconds (or four inversions) every minute for the remainder of the development time.

	Normal contrast*	High contrast*
PERCEPTOL	11	16
ID-11	6	8½
MICROPHEN	4½	7

* 'Normal' contrast and 'high' contrast refer to the negative contrast required for printing in a condenser and diffuser enlarger respectively.

When continuous agitation is given — as in a dish or with some types of developing tank — the development times should be reduced by one third.

6.1 Dilute or one-shot development

Dilute or one-shot development with PERCEPTOL, ID-11 or MICROPHEN developer gives improved acutance over stock solution or deep tank processing. For the finest detail rendition, develop PAN F in PERCEPTOL diluted for one-shot use.

Dilute development is particularly suitable for subjects with long tonal scales - shadow and highlight densities are retained while negatives are sufficiently contrasty to produce bright prints.

Diluted developer should be used once only and then discarded. The table below gives development times in minutes at 20°C with intermittent agitation.

	Dilution	Normal contrast	High contrast
PERCEPTOL*	1+1	12½	18
	1+3	17	25
ILFOSOL2	1+9	3½	5
ID-11	1+1	8½	12
	1+3	12½	18
MICROPHEN	1+1	5½	8½
	1+3	8½	12½

* When changing from stock solution to one-shot processing with PERCEPTOL developer, set the film speed to 32ASA 16DIN for normal contrast and 40ASA 17DIN for high contrast negatives. With ID-11 and MICROPHEN developers, PAN F film speed remains the same regardless of recommended development technique.

7 Fixation

After development the film should be rinsed and then fixed in an acid fixer such as HYPAM, which fixes the film in 2—4 minutes. If a hardening fixer is required add RAPID HARDENER - for maximum hardening the fixing time should be 4 minutes. Alternatively, ILFOFIX, which fixes and hardens the film in 10—20 minutes, may be used.

8 Washing

The washing time for a film largely depends on whether or not it has been hardened during fixation. Where films have been hardened in a hardening fixer, thoroughly wash the film in running water for 15-20 minutes.

Where it is considered unnecessary to harden film and where the processing temperature is below 25°C an alternative method of washing may be followed which not only saves water and time, but still gives archival permanence.

- 1 Process your film in a spiral tank.
- 2 Fix it, using a non-hardening fixer such as ILFORD HYPAM.
- 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.

A final rinse in water to which ILFORD ILFOTOL wetting agent has been added will aid rapid and uniform drying. The film should then be dried in a dust-free atmosphere.

9 Machine processing

PAN F can be processed in all automatic general purpose film processors. ILFORD ILFONEG film developer/replenisher is recommended for this purpose.

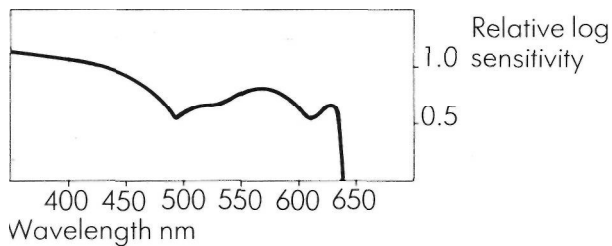
The following table gives development times in seconds for automatic processing at 30°C.

	Normal contrast	High contrast
ILFONEG	25	50

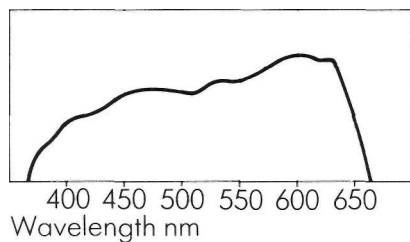
After development fix PAN F in ILFORD HYPAM (1+4) with ILFORD RAPID HARDENER. Use of the hardener is essential when machine processing.

10 Spectral sensitivity

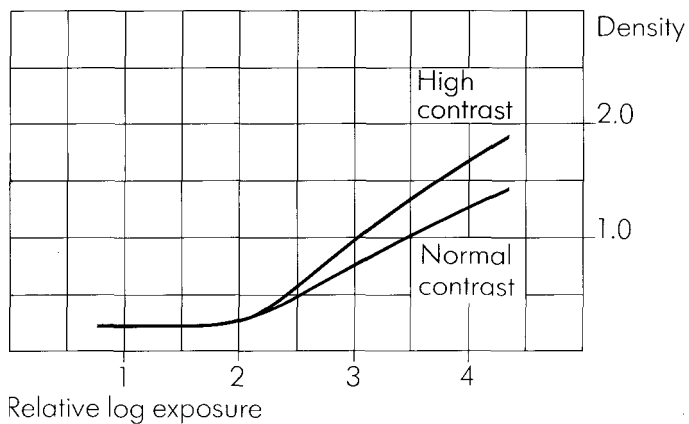
10.1 Equal energy



10.2 Wedge spectrogram to tungsten light (2850°K)



11 Characteristic curves

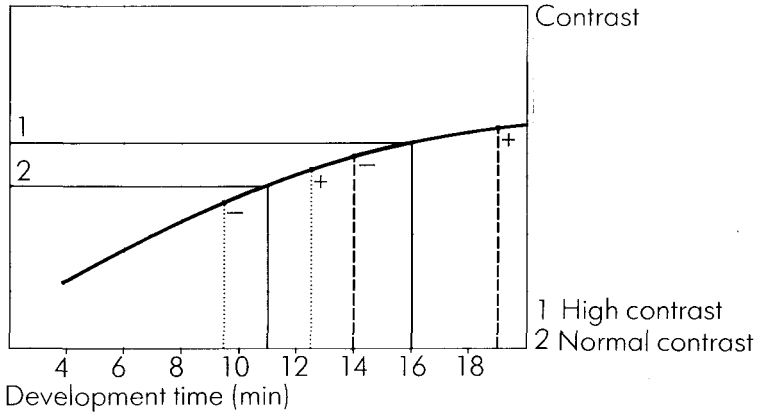


PAN F developed in ID-11 at 20°C with intermittent agitation.

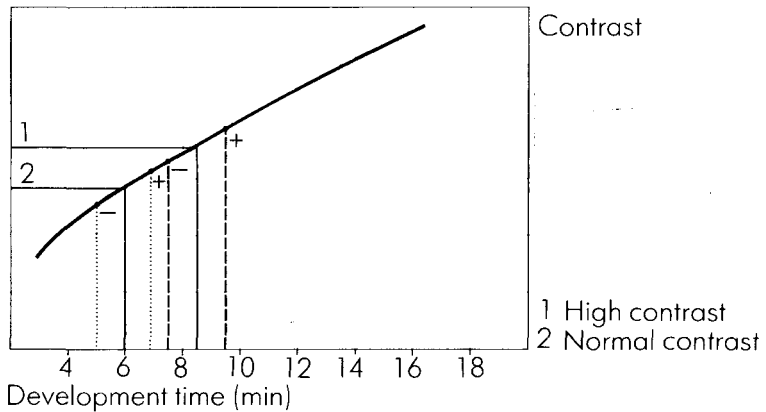
12 Contrast-time curves

The charts below show the development times for 'normal' and 'high' contrast, and, in addition offer other times to compensate for subject brightness variations. The times indicated by the '-' line may be used where the subject brightness range is large. Conversely, the longer times indicated by the '+' line may be used where the subject brightness range is small. The times below are a guide because it is appreciated that certain conditions may require even greater variations in development time.

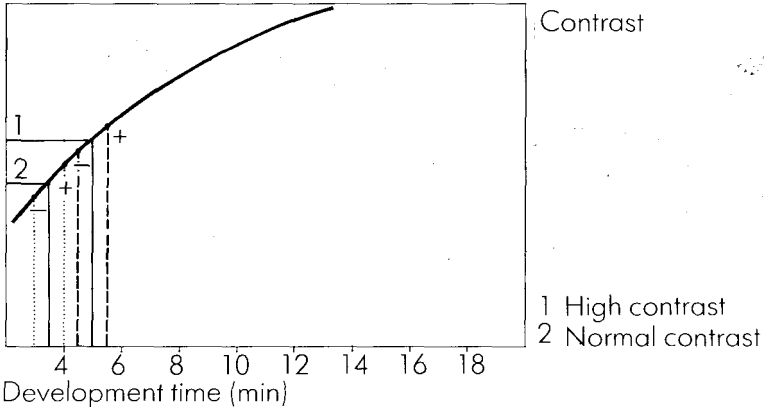
12.1 PERCEPTOL



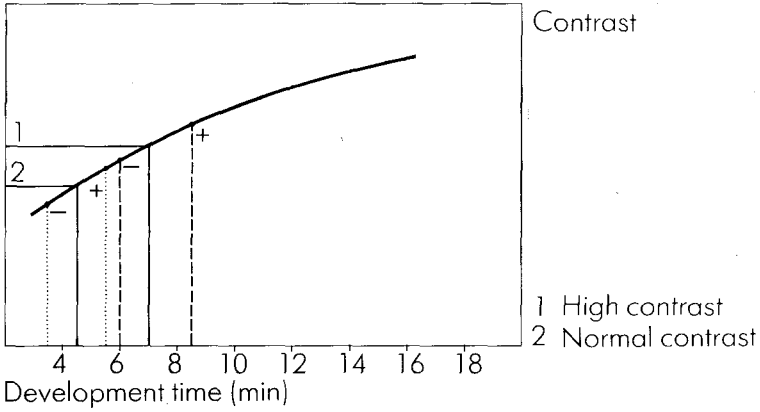
12.2 ID-11



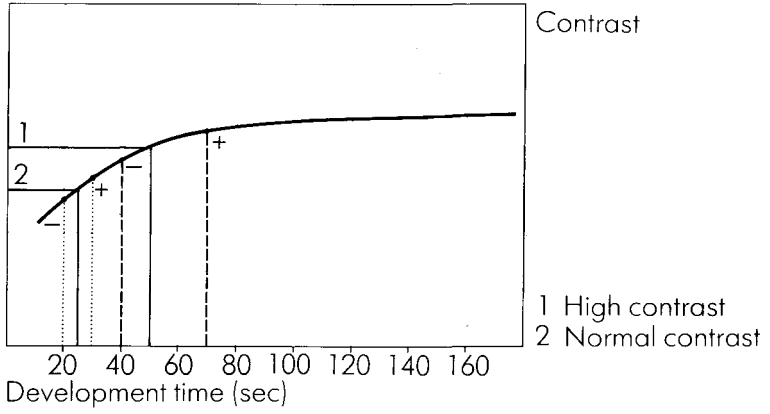
12.3 ILFOSOL 2 (1+9)



12.4 MICROPHEN



12.5 ILFONEG



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