

ILFORD

PRODUCT DATA GUIDE



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V1.0

ILFORD

Welcome to the first electronic version of the ILFORD PRODUCT DATA GUIDE. The table of contents, on pages 3 and 4, contains links to each section in the guide.

Click on the description or page number to open that page.

Clicking on any page number in the document will bring you back to the table of contents.

We hope you find the electronic Data Guide useful. For the most current information on ILFORD products, please visit: www.ilford.com

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HOW TO CONTACT...

ILFORD Imaging USA Inc
West 70 Century Road
Paramus, NJ 07652
(201) 265-6000

WORLDWIDE WEB ADDRESS:

ilford.com

**ILFORD 24-HOUR MEDICAL EMERGENCY HOTLINE:
1-800-842-9660 (USA and Canada)**

ILFORD TECHNICAL PRODUCT ASSISTANCE:

(201) 265-6000 (9am - 5pm Eastern Time) USA

(905) 479-2555 (9am - 5pm Eastern Time) Canada

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The characteristic curves and data given in this technical booklet represent results measured in our labs under specific exposure and processing conditions. Other conditions may lead to different results. ILFORD reserves the right to modify the product characteristics at any time and consequently the information given in this publication is subject to change without notice.

Printed in USA

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Paramus, New Jersey 07652
(201) 265-6000

ILFORD Imaging Canada Limited
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Markham, Ontario
Canada L3R 3V8
(905) 479-2555

AN INVITATION TO JOIN...

ILFOPRO

ILFOPRO PHOTOGRAPHERS ASSOCIATION

Here's a special invitation for you to join the ILFOPRO PHOTOGRAPHERS ASSOCIATION.

This Association was created specifically to support the efforts of professional photographers and printers with technical and product information, helpful hints and techniques, and time-and money-saving solutions to common technical problems. Our goal is to assist you with photography in as many ways as we can.

To receive an ILFOPRO enrollment package, call 1-800-631-2522 or sign up on the ILFORD web site at: ilford.com. In this package you will find a copy of the Association's newsletter *ILFOPRO* and a postage-paid application form. As soon as we receive your completed application, you will begin enjoying the many benefits of membership including:

- *ILFOPRO* newsletter
- Opportunity to field test new products
- Discounts on workshops
- Updated technical information
- Selected product samples
- Special offers...AND MORE!

OFFER GOOD IN USA AND CANADA ONLY

Café ILFOPRO

Café ILFOPRO is an Internet meeting place where members can discuss trends, technical issues and the aesthetics of photography in the member forums. It is also a resource to view ILFOPRO member photographs in the Postcard Forum, read back issues of the printed newsletter, and provides a link to technical information.

It's members only for Café ILFOPRO, but membership is free, and it's easy to sign up right on line. Click on the "Join ILFOPRO" link and sign up now! All current ILFOPRO members need a special password to enter the Café which we will e-mail to you as soon as you re-join on-line.

Go to ilford.com and follow the link to ILFOPRO Members.

ILFORD Photo Instructor Newsletter and the Teacher's Lounge

Do you teach photography and digital imaging? ILFORD publishes a newsletter just for teachers. For a free subscription, send a letter on your school letterhead to the address on page 5, or sign up at ilford.com and follow the link to the Teacher's Lounge.

ENVIRONMENTAL & SAFETY CONSIDERATIONS

ENVIRONMENTAL AND SAFETY CONSIDERATIONS

ILFORD makes every effort to comply with recognized national and international authorities for proper user safety and environmental protection.

Photographic chemicals are not hazardous when used correctly and when basic rules of common sense are observed. On each container of ILFORD chemicals are health and safety recommendations, as a guide to safe handling and use.

Detailed safe handling, first aid, disposal and transportation information is contained in the Material Safety Data Sheets (MSDS) for each ILFORD photo chemical product. Additional MSDS can be obtained by contacting your supplier or by directly contacting ILFORD Technical Service at:

USA CUSTOMERS

ILFORD Imaging USA Inc
West 70 Century Road
Paramus, New Jersey 07652
(201) 265-6000

CANADIAN CUSTOMERS

ILFORD Imaging Canada Limited
361 Steelcase Rd. W. Unit #4
Markham, Ontario
Canada L3R 3V8
(905) 479-2555

OR print MSDS directly from the internet at ilford.com.
Select the American/Canadian MSDS sheets

KEEP ALL PHOTO PROCESSING CHEMICALS OUT OF THE REACH OF CHILDREN.

For your safety, always use face or eye protection and wear suitable rubber gloves when handling or mixing chemicals. Use only in well ventilated areas. Do not eat, drink or smoke in areas where chemicals are handled or used.

**CALL THE EMERGENCY RESPONSE CENTER
(24 HOURS) AT 1-800-842-9660
(USA AND CANADIAN CUSTOMERS)
FOR MEDICAL EMERGENCY INFORMATION.**

ILFORD

BLACK AND WHITE FILM

Camera Films

Description

PAN F Plus

Slow speed, extremely fine grain film with exceptional sharpness

FP4 Plus

Medium speed, very fine grain film for general purpose photography

HP5 Plus

Fast fine grain film for available light or action photography

100 **DELTA** PROFESSIONAL

Extremely fine grain medium speed film with outstanding sharpness

DELTA 400 PROFESSIONAL

High speed film with excellent grain and sharpness

DELTA 3200 PROFESSIONAL

Ultra high speed film for fast action or low light photography

SFX 200

Medium speed film with extended red sensitivity for infrared-like special effects

ORTHO Plus

Medium speed film with high resolution characteristics for continuous tone copy work

XP2 SUPER

Silver-free, dye image negatives with remarkably fine grain

FilmSpeed Daylight	Color Sensitivity	Available Formats	Processing
50	Pan	135, 120	Standard B&W
125	Pan	135, 120, 220 sheet sizes	Standard B&W
400	Pan	135, 120, 220 sheet sizes	Standard B&W
100	Pan	135, 120 sheet sizes	Standard B&W
400	Pan	135, 120	Standard B&W
3200	Pan	135, 120	Standard B&W
200	Pan w/extended red sensitivity	135, 120	Standard B&W
80	Ortho	4x5, 8x10	Standard B&W
400	Pan	135, 120	C-41 Color Neg

ILFORD

FILM APPLICATIONS AND FEATURES

FILM APPLICATIONS

Application	100 DELTA PROFESSIONAL	DELTA 400 PROFESSIONAL	DELTA 3200 PROFESSIONAL
Architecture	●	●	
Copy Work	●	●	
Fine Art	●	●	●
General Purpose	●	●	
Landscape	●	●	
Outdoor Portrait/People	●	●	
Press			●
Scientific Reporting			
Sports/Action		●	●
Studio Advertising	●	●	
Studio Portrait	●	●	

FILM FEATURES

Feature	100 DELTA PROFESSIONAL	DELTA 400 PROFESSIONAL	DELTA 3200 PROFESSIONAL
New Emulsion Technology	●	●	●
Recommended for Push Processing (Above EI 400/27)			●
Ultra High Speed (EI 400/27 – EI 3200/31)			●
Fast Speed (EI 400/27)		●	
Medium Speed (EI 200/24) (EI 125/22) (EI 100/21)	●		
Slow Speed (EI 50/18)			
Very Fine Grain	●		
Fine Grain		●	
Exceptional Sharpness	●	●	
Wide Exposure Latitude		●	●
Black & White Processing	●	●	●
C-41 Color Processing			
Black & White Slides	●		

HP5 PLUS	FP4 PLUS	PAN F PLUS	XP2 SUPER	ORTHO PLUS	SFX 200
	●		●		
	●	●	●	●	
	●	●	●		●
●	●		●		
	●	●	●		●
	●		●		
●			●		
●	●	●	●	●	
●			●		
	●	●	●		
	●	●	●		

HP5 PLUS	FP4 PLUS	PAN F PLUS	XP2 SUPER	ORTHO PLUS	SFX 200
	●				
●			●		
					●
	●			●	
		●			
		●	●		
●	●				
		●			
●	●		●		
●	●	●		●	●
			●		
	●	●			



DESCRIPTION

ILFORD PAN F Plus is an extremely fine grain, black and white film. When given standard development it has a speed rating of ISO 50/18° to daylight.

In addition to its ultra-fine grain, PAN F Plus has outstanding resolution, sharpness and edge contrast. These characteristics enable the very highest image quality to be achieved and make PAN F Plus the natural film choice where fine detail and lack of grain are more important than film speed. Mural size enlargements from PAN F Plus negatives show an outstanding range of tone and detail when the film is carefully exposed and processed.

PAN F Plus 35mm film is available in 36-exposure DX-coded cassettes and is coated on 0.125mm (5 mil) acetate base.

PAN F Plus roll film is coated on 0.110mm (4mil) clear acetate base with an antihalation backing that clears during development. PAN F Plus roll film is available in 120 lengths and is edge numbered 1 to 19, to ensure all formats can be identified whatever camera format is being used.

EXPOSURE RATING

PAN F Plus has a speed rating of ISO 50/18° (50ASA, 18DIN, EI 50/18) to daylight and is recommended for general photography in good lighting conditions. The ISO speed rating was measured using ILFORD ID-11 developer at 68°F with intermittent agitation in a spiral tank. While a meter setting of EI 50/18 is recommended for optimum results, high-quality results are also obtained when PAN F Plus is exposed at EI 25/15.

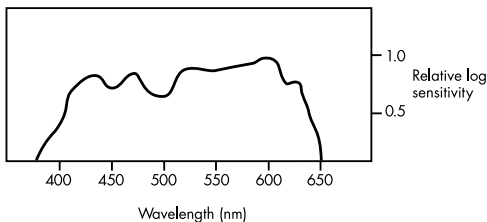
It should be noted that the exposure index (EI) recommended for PAN F Plus is based on a practical evaluation of film speed and is not based on foot speed, as is the ISO standard.

FILTER FACTORS

For filter factor information see page 39.

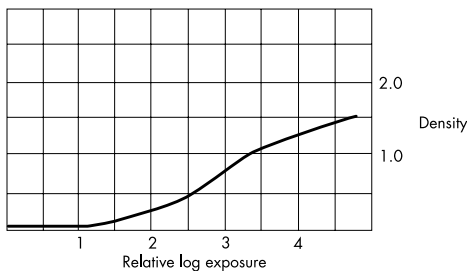
SPECTRAL SENSITIVITY

Wedge spectrogram to tungsten light (2850K)



CHARACTERISTIC CURVE

PAN F Plus developed in ILFORD ID-11 stock for 6½ min. at 68°F (20°C) with intermittent agitation.



CHOOSING THE BEST ILFORD DEVELOPER FOR THE JOB

Manual Processing (e.g., Spiral Tank, Tray, Deep Tank)

Requirement	Liquid	Powder
Best Overall Image Quality	ILFOTEC DD-X (1+4)	ID-11 (Stock)
Finest Grain	ILFOTEC DD-X (1+4)	PERCEPTOL (Stock)
Maximum Sharpness	ILFOTEC DD-X (1+4)	ID-11 (1+3)
One-Shot Convenience	ILFOSOL S (1+9)	ID-11 (1+1) MICROPHEN (1+1)
Economy	ILFOTEC HC (1+47)	ID-11 (1+3) MICROPHEN (1+3)
Replenishable	ILFOTEC HC	—

Machine Processing

Dip and Dunk	ILFOTEC DD ILFOTEC HC	Best overall image quality Flexible process time, range of dilutions and long tank life
Leader Card	ILFOTEC HC	Range of dilutions, flexibility
Roller Transport	ILFOTEC RT RAPID	Rapid processing, best image quality

For complete development times, see chart on pages 44 and 48.

For detailed processing information see page 40.



DESCRIPTION

ILFORD FP4 Plus is an exceptionally fine grain, medium speed black and white film.

FP4 Plus has a high acutance emulsion, which, combined with its fine grain and exposure latitude, ensures superlative quality. It is the ideal film to use for all high-quality indoor and outdoor photography. FP4 Plus is versatile and will give useable results even if it is overexposed by as much as six stops or underexposed by two stops.

FP4 Plus 35mm film is coated on 0.125mm (5 mil) acetate base and is available in 24- or 36-exposure DX-coded cassettes, or in bulk film lengths of 100 feet.

FP4 Plus roll film is coated on 0.110mm (4mil) clear acetate base with an antihalation backing that clears during development. FP4 Plus roll film is available in 120 and 220 lengths and is edge numbered 1 to 19 for 120 and 1 to 40 for 220 to ensure all formats can be identified, whatever camera format is being used.

FP4 Plus sheet film is available in a wide range of standard sizes. It is coated on 0.175mm (7mil) polyester base, offering rigidity and dimensional stability.

EXPOSURE RATING

FP4 Plus has a speed rating of ISO 125/22° (125ASA, 22DIN, EI 125/22) to daylight and is recommended for general photography in all types of lighting. While a meter setting of EI 125/22 is recommended for optimum results, high-quality results are also obtained when FP4 Plus is exposed over the range EI 50/18 to EI 200/24.

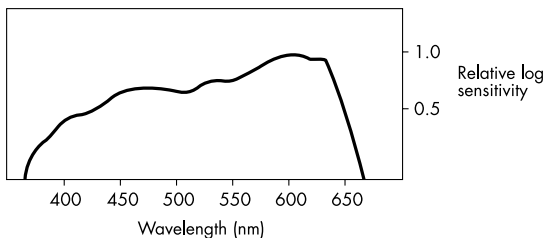
It should be noted that the exposure index (EI) range recommended for FP4 Plus is based on a practical evaluation of film speed and is not based on foot speed, as is the ISO standard.

FILTER FACTORS

For filter factor information see page 39.

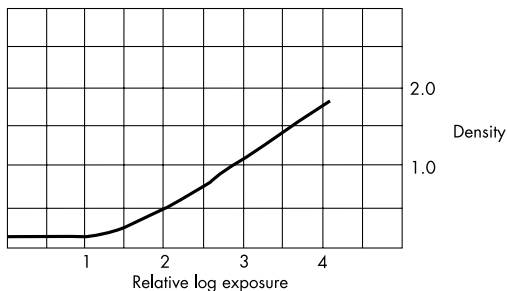
SPECTRAL SENSITIVITY

Wedge spectrogram to tungsten light (2850K)



CHARACTERISTIC CURVE

FP4 Plus developed in ILFORD ID-11 stock for 6 min. at 68°F (20°C) with intermittent agitation.



CHOOSING THE BEST ILFORD DEVELOPER FOR THE JOB

Manual Processing (e.g., Spiral Tank, Tray, Deep Tank)

Requirement	Liquid	Powder
Best Overall Image Quality	ILFOTEC DD-X (1+4)	ID-11 (Stock)
Finest Grain	ILFOTEC DD-X (1+4)	PERCEPTOL (Stock)
Maximum Sharpness	ILFOSOL S (1+9)	ID-11 (1+3)
Maximum Film Speed (EI 400/27)	ILFOTEC DD-X (1+4)	MICROPHEN (Stock)
One-Shot Convenience	ILFOSOL S (1+9)	ID-11 (1+1) MICROPHEN (1+1)
Economy	ILFOTEC HC (1+47)	ID-11 (1+3) MICROPHEN (1+3)
Replenishable	ILFOTEC HC	

Machine Processing

Dip and Dunk	ILFOTEC DD ILFOTEC HC	Best overall image quality Flexible process time, range of dilutions, economy and long tank life
Leader Card	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, best overall image quality

For complete development times, see chart on pages 44 and 48.

For detailed processing information see page 40.



DESCRIPTION

HP5 Plus is a fast black and white film. It is ideal for action, available light and general purpose photography.

HP5 Plus has the fine grain, good edge contrast and sharpness required to give excellent image quality. These characteristics give prints with outstanding brightness and a full tonal range.

Although rated at ISO 400/27°, by extending development with some developers, for example ILFORD ILFOTEC HC and ILFORD MICROPHEN, it is possible to use meter settings up to EI 3200/36.

HP5 Plus is compatible with all current processing systems including those that give the standard short fixing and washing times.

HP5 Plus is coated on 0.125mm (5mil) acetate base and is available in 24- or 36-exposure DX cassettes or in bulk film lengths of 100 feet (30.5m). HP5 Plus roll film is coated on 0.110mm (4mil) clear acetate base with an antihalation backing that clears during development. HP5 Plus roll film is available as 120 and 220 lengths. It is edge numbered 1 to 19 for 120 and 1 to 40 for 220.

HP5 Plus sheet film is available in a wide range of standard and large format panoramic sizes. It is coated on 0.175mm (7mil) polyester base, offering rigidity and dimensional stability. The base has an antihalation backing that clears during development.

EXPOSURE RATING

HP5 Plus has a speed rating of ISO 400/27° (400ASA, 27DIN, EI 400/27) to daylight and is recommended for general photography in all types of lighting. When working in low light conditions, the versatility of HP5 Plus can be exploited by using meter settings between EI 400/27 and EI 1600/33.

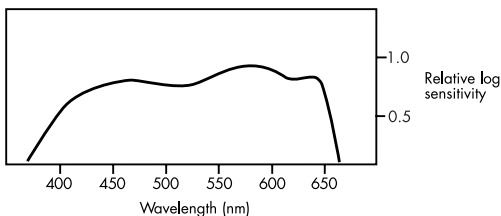
It should be noted that the exposure index (EI) recommended when push processing HP5 Plus is based on a practical evaluation of film speed and is not based on foot speed, as is the ISO standard.

FILTER FACTORS

For filter factor information see page 39.

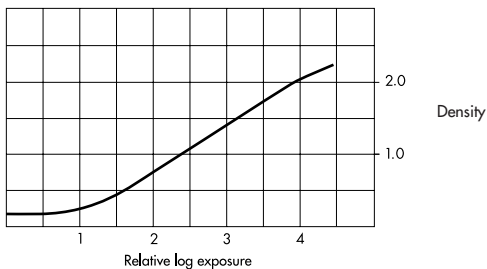
SPECTRAL SENSITIVITY

Wedge spectrogram to tungsten light (2850K)



CHARACTERISTIC CURVE

HP5 Plus developed in ILFORD ID-11 stock for 7½ min. at 68°F (20°C) with intermittent agitation.



CHOOSING THE BEST ILFORD DEVELOPER FOR THE JOB

Manual Processing (e.g., Spiral Tank, Tray, Deep Tank)

Requirement	Liquid	Powder
Best Overall Image Quality at Meter Setting:		
EI 400/27	ILFOTEC DD-X (1+4)	ID-11 (Stock)
EI 800/30	ILFOTEC DD-X (1+4)	ID-11 (Stock)
EI 1600/33	ILFOTEC DD-X (1+4)	MICROPHEN (Stock)
Finest Grain	ILFOTEC DD-X (1+4)	PERCEPTOL (Stock)
Maximum Sharpness	ILFOSOL S (1+9)	ID-11 (1+3)
Maximum Film Speed	ILFOTEC DD-X (1+4)	MICROPHEN (Stock)
One-Shot Convenience	ILFOSOL S (1+9)	ID-11 (1+1) MICROPHEN (1+1)
Economy	ILFOTEC HC (1+47)	ID-11 (1+3) MICROPHEN (1+3)
Rapid Processing	ILFOTEC HC (1+15)	
Replenishable	ILFOTEC HC	

Machine Processing

Dip and Dunk	ILFOTEC DD	Best overall image quality, maximum film speed
	ILFOTEC HC	Flexible process time, range of dilutions
Leader Belt	ILFOTEC HC	Range of dilutions, flexibility
Roller Transport	ILFOTEC RT RAPID	Rapid processing

For complete development times, see chart on pages 44 and 48.

For detailed processing information see page 40.

DESCRIPTION

ILFORD 100 DELTA PROFESSIONAL is a medium speed black and white film, ideal for pictorial and fine art photography. It is compatible with all major processing systems and can be processed in all popular developers.

100 DELTA PROFESSIONAL 35mm film is coated on 0.125mm (5mil) clear acetate base and is available in 24- or 36- exposure DX-coded cassettes or in bulk film lengths of 100 feet (30.5m).

100 DELTA PROFESSIONAL roll film is coated on 0.110mm (4mil) clear acetate base with 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.

100 DELTA PROFESSIONAL sheet film is available in a wide range of standard sizes. It is coated on 0.175mm (7mil) polyester base, offering rigidity and dimensional stability.

EXPOSURE RATING

100 DELTA PROFESSIONAL has a speed rating of ISO 100/21° (100ASA, 21DIN, 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.

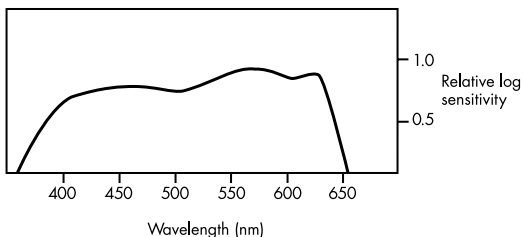
It should be noted that the exposure index (EI) recommended for 100 DELTA PROFESSIONAL is based on a practical evaluation of film speed and is not based on foot speed, as is the ISO standard.

FILTER FACTORS

For filter factor information see page 39.

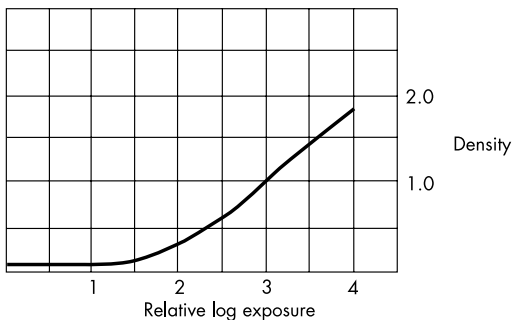
SPECTRAL SENSITIVITY

Wedge spectrogram to tungsten light (2850K)



CHARACTERISTIC CURVE

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



CHOOSING THE BEST ILFORD DEVELOPER FOR THE JOB

Manual Processing (e.g., Spiral Tank, Tray, Deep Tank)

Requirement	Liquid	Powder
Best Overall Image Quality	ILFOTEC DD-X (1+4)	ID-11 (Stock)
Finest Grain (EI 50/18)	ILFOTEC DD-X (1+4)	PERCEPTOL (1+1)
Finest Grain (EI 100/21)	ILFOTEC DD-X (1+4)	PERCEPTOL (Stock)
Maximum Sharpness	ILFOTEC HC (1+31)	ID-11 (1+3)
Maximum Film Speed (EI 200/24)	ILFOTEC DD-X (1+4)	MICROPHEN (Stock)
One-Shot Convenience	ILFOSOL S (1+9)	ID-11 (1+1) MICROPHEN (1+1)
Economy	ILFOTEC HC (1+31)	ID-11 (1+3) MICROPHEN (1+3)
Replenishable	ILFOTEC HC	

Machine Processing

Dip and Dunk	ILFOTEC DD ILFOTEC HC	Best overall image quality (liquid) Flexible process time, range of dilutions and economy
Leader Card	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, best overall image quality

For complete development times, see chart on pages 46 and 50.

For detailed processing information see page 40.

DESCRIPTION

DELTA 400 PROFESSIONAL is a fast, fine grain, black and white film, ideal for pictorial and fine art photography. Prints made from DELTA 400 PROFESSIONAL film exposed at EI 400/27 have very fine grain and outstanding sharpness. Its exposure latitude allows good quality results to be obtained over the exposure range EI 200/24 to EI 1600/33.

DELTA 400 PROFESSIONAL 35mm film is coated on 0.125mm (5mil) acetate base and is available in 24- or 36-exposure DX-coded cassettes or in bulk film lengths of 100 feet (30.5m).

DELTA 400 PROFESSIONAL roll film is coated on 0.110mm (4mil) clear acetate base with an antihalation backing that clears during development. DELTA 400 PROFESSIONAL roll film is available in 120 length and is edge numbered 1 to 19.

EXPOSURE RATING

DELTA 400 PROFESSIONAL has a speed rating of ISO 400/27° (400ASA, 27DIN, EI 400/27) to daylight and is recommended for pictorial and fine art photography in all types of lighting. Best results are obtained at EI 400/27, but excellent image quality will also be obtained at meter settings from EI 200/24 to EI 1600/33.

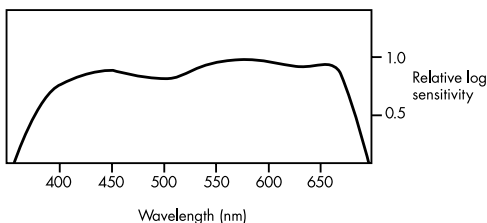
It should be noted that the exposure index (EI) recommended for DELTA 400 PROFESSIONAL is based on a practical evaluation of film speed and is not based on foot speed, as is the ISO standard.

FILTER FACTORS

For filter factor information see page 39.

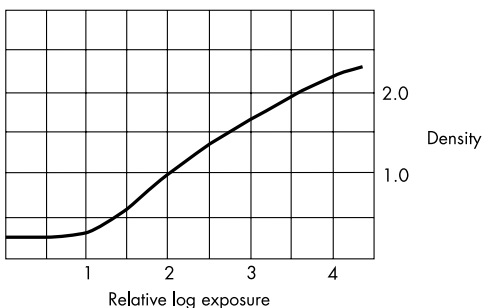
SPECTRAL SENSITIVITY

Wedge spectrogram to tungsten light (2850K)



CHARACTERISTIC CURVE

DELTA 400 PROFESSIONAL film developed in ILFORD ID-11 stock for 11½ min. at 68°F (20°C) with intermittent agitation.



CHOOSING THE BEST ILFORD DEVELOPER FOR THE JOB

Manual Processing (e.g., Spiral Tank, Tray, Deep Tank)

Requirement	Liquid	Powder
Best Overall Image Quality	ILFOTEC DD-X (1+4)	ID-11 (Stock)
Finest Grain	ILFOTEC DD-X (1+4)	PERCEPTOL (Stock)
Maximum Sharpness	ILFOSOL S (1+9)	ID-11 (1+3)
Maximum Film Speed	ILFOTEC DD-X (1+4)	MICROPHEN (Stock)
One-Shot Convenience	ILFOSOL S (1+9)	ID-11 (1+1) MICROPHEN (1+1)
Economy	ILFOSOL S (1+14)	ID-11 (1+3) MICROPHEN (1+3)
Replenishable	ILFOTEC HC	

Machine Processing

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

For complete development times, see chart on pages 46 and 50.
For detailed processing information see page 40.

DESCRIPTION

ILFORD DELTA 3200 PROFESSIONAL is an ultra-high speed black and white film, ideal for fast action and low light photography. With a measured speed of up to ISO1000 (up to ISO 1250 when developed in ILFORD MICROPHEN developer) the film has been designed to be 'push' processed to achieve its nominal speed of EI 3200. It may be further 'pushed' to EI 12,500 or even EI 25,000 with ILFORD MICROPHEN developer, or 'pulled' to provide good results.

DELTA 3200 PROFESSIONAL 35mm film is coated on a 0.125mm (5mil) clear acetate base. It is available in 36-exposure DX- coded cassettes.

DELTA 3200 PROFESSIONAL roll film is coated on a 0.125mm (5mil) clear acetate base. It is available in 120 format and is edge numbered 1 to 19.

EXPOSURE RATING

DELTA 3200 PROFESSIONAL film has a speed rating of ISO 1000/31° (1000ASA, 31DIN, EI 1000/31) to daylight. The ISO speed rating was obtained using ILFORD ID-11 Developer at 68°F (20°C) with intermittent agitation in a spiral tank.

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. The DX coding on the cassette will read EI 3200 in those cameras with an automatic setting option. It can be used in all types of lighting.

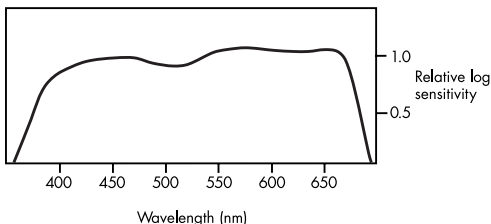
It should be noted that the exposure index (EI) range recommended for DELTA 3200 PROFESSIONAL is based on a practical evaluation of film speed and is not based on foot speed as is the ISO standard.

FILTER FACTORS

For filter factor information see page 39.

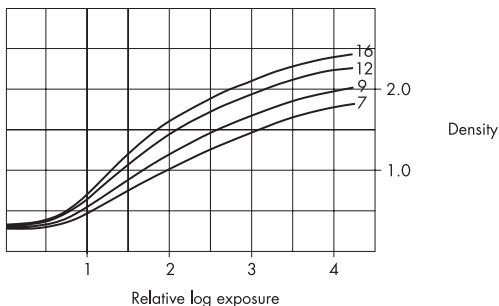
SPECTRAL SENSITIVITY

Wedge spectrogram to tungsten light (2850K)



CHARACTERISTIC CURVE

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



CHOOSING THE BEST ILFORD DEVELOPER FOR THE JOB

Manual Processing (e.g., Spiral Tank, Deep Tank)

Requirement	Liquid	Powder
Best Overall Image Quality at Meter Setting:		
EI 400/27	ILFOTEC DD-X (1+4)	PERCEPTOL (Stock)
EI 800/30	ILFOTEC DD-X (1+4)	PERCEPTOL (Stock)
EI 1600/33	ILFOTEC DD-X (1+4)	MICROPHEN (Stock)
EI 3200/36	ILFOTEC DD-X (1+4)	MICROPHEN (Stock)
EI 6400/39	ILFOTEC DD-X (1+4)	MICROPHEN (Stock)
Finest Grain	ILFOTEC DD-X (1+4)	PERCEPTOL (Stock)
Maximum Sharpness	ILFOTEC DD-X (1+4)	MICROPHEN (Stock)
Maximum Film Speed (up to EI 25000/45)	ILFOTEC DD-X (1+4)	MICROPHEN (Stock)
One-Shot Convenience	ILFOSOL S (1+9)	
Rapid Processing	ILFOTEC HC	MICROPHEN (Stock)

Machine Processing

Dip and Dunk	ILFOTEC DD	Best overall image quality and long tank life Flexible process time, range of dilutions
	ILFOTEC HC	
Leader Belt	ILFOTEC RT RAPID	Rapid processing, best overall image quality and long tank life Range of dilutions, flexibility & economy
	ILFOTEC HC	
Roller Transport	ILFOTEC RT RAPID	Rapid processing

For complete development times, see chart on pages 46 and 50.

For detailed processing information see page 40.

DESCRIPTION

ILFORD XP2 SUPER is a black and white ISO 400 panchromatic film offering the exceptional fine grain and sharpness associated with a slower, general purpose film. XP2 SUPER offers improved exposure latitude compared with its predecessor XP2, and provides exceptionally sharp, crisp images. The excellent highlight and shadow detail, in addition to enhanced negative contrast, ensures superb quality prints on B&W paper. The outstanding performance of XP2 SUPER arises from the inclusion of color dye technology. XP2 SUPER black and white film must be processed in C-41 type color negative chemicals.

XP2 SUPER 35mm film is coated on 0.125mm (5 mil) acetate base and is available in 24- or 36-exposure DX-coded cassettes or in bulk film lengths of 100 feet (30.5m).

XP2 SUPER 120 roll film is coated on 0.110mm (4mil) clear acetate base with an antihalation backing. This backing clears during development. XP2 SUPER roll film is edge numbered 1 to 19 to ensure all formats can be frame-identified. The backing paper has a white outer surface for easy frame identification. The portion of backing paper visible after exposure is black with white printing for quick identification of exposed films. Following international standards, XP2 SUPER roll film also has a red exposed label to signify color processing. This makes it easy to differentiate it from standard black and white films.

EXPOSURE RATING

XP2 SUPER has a speed rating of ISO 400/27° (400 ASA, 27DIN, EI 400/27) to daylight. When higher speed is required, it may be rated at up to EI 800/30. For finer grain, when speed is less important, the film should be rated at EI 200/24, although for finest grain it can be rated as low as EI 50/18 if required.

It should be noted that the exposure index (EI) recommended for XP2 SUPER is based on a practical evaluation of film speed and is not based on foot speed, as is the ISO standard.

XP2 SUPER has an extremely wide exposure latitude—it may be exposed over the range ISO 100/21°–800/30°. XP2 SUPER may be exposed as low as ISO 50/18°, however, the result is a dense negative, often requiring long exposure times when printing. Even finer grain results are obtained when XP2 SUPER is exposed at less than ISO 400/27°; when rated at higher than ISO 400/27°, there is only a slight loss of quality.

ILFORD

XP2

Super

400

COMPATIBILITY

XP2 SUPER is designed to be processed in C-41 type color negative chemicals. As a result, it can be processed alongside all color negative films. No special treatment is required—times and temperatures remain the same.

This means that XP2 SUPER can be processed by any professional lab, photofinisher or minilab offering a color negative processing service. XP2 SUPER negatives may also be printed by these same labs or minilabs on color paper if proof prints are required. For maximum convenience in the lab, expose XP2 SUPER at EI 400/27 when proof prints are required.

Proof prints made on color paper are a fast, effective guide to determine which negative should be enlarged on black and white printing papers, such as the range of ILFORD variable contrast and graded papers. The color of prints made from XP2 SUPER negatives on color paper will vary from near neutral to sepia or other tints.

A benefit of using a color negative processing service for XP2 SUPER is that the film will be processed in professional equipment where chemicals are monitored and process times and temperatures are accurately controlled. However, XP2 SUPER can also be processed in any darkroom using a reel and spiral tank with a C-41 processing kit.

CHOOSING THE RIGHT FILM SPEED FOR THE JOB

Best overall quality	EI 400/27
Finer grain (with easy printing)	EI 200/24
Finest grain (with denser negatives)	EI 50/18
Maximum speed	EI 800/30

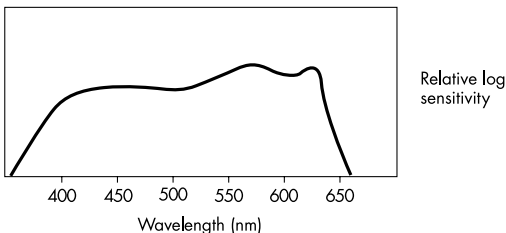
NOTE: No matter which film speed is chosen, standard C-41 processing is required.

FILTER FACTORS

For filter factor information see page 39.

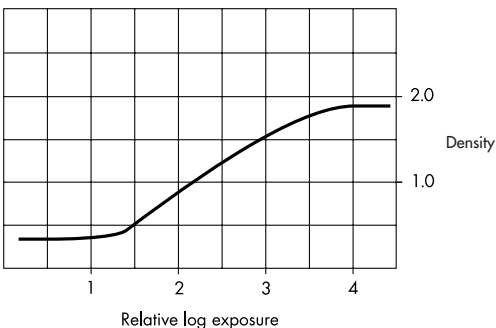
SPECTRAL SENSITIVITY

Wedge spectrogram to tungsten light (2850K)



CHARACTERISTIC CURVE

This curve was plotted from readings obtained using a neutral filter. XP2 SUPER was processed through standard C-41 type chemicals.



ORTHO PLUS

DESCRIPTION

The properties of ILFORD ORTHO Plus film allow contrast control over a very wide range, making it suitable for many applications, especially the copying of original images.

ILFORD ORTHO Plus film is a blue-green sensitive, medium speed film with high resolution characteristics. It is particularly versatile because it can be processed to a range of contrasts.

The main application of ORTHO Plus film is continuous tone copy work, as well as some line work. It is also recommended for photomicroscopy.

ORTHO Plus film emulsion is coated on a 0.18mm (7mil) polyester base, well known for its high dimensional stability and strength, protected by an efficient antihalation backing which clears during development. If processed and stored properly, ORTHO Plus film has excellent archival storage properties.

ORTHO Plus film is available in 4"x5" and 8"x10" sheet sizes, 25 sheets per box.

EXPOSURE RATING

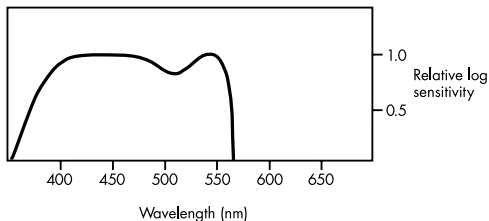
ORTHO Plus has a speed rating of ISO 80/20° (80 ASA, 20 DIN, EI 80/20) to daylight, and ISO 40/17° (40 ASA, 17 DIN, EI 40/17) to tungsten light. The ISO speed rating was measured using ILFORD ID-11 developer with intermittent agitation in a tray.

FILTER FACTORS

For filter information see page 39.

SPECTRAL SENSITIVITY

Wedge spectrogram to tungsten light (2850K)

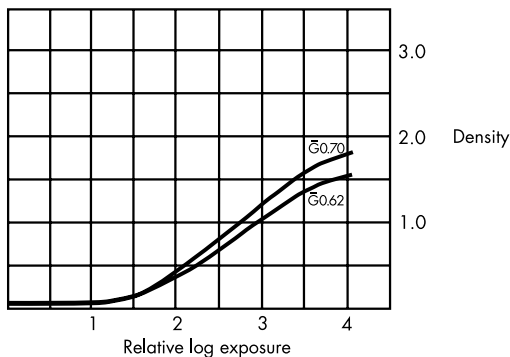


ORTHO PLUS

CHARACTERISTIC CURVES

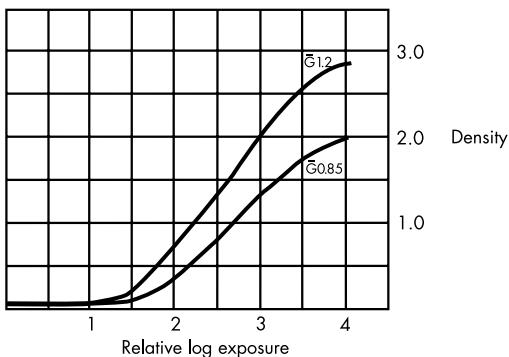
Pictorial Contrast

ORTHO Plus copy film developed in ILFORD ID-11 (stock) for 8 minutes ($\bar{G}0.62$) and 10 minutes ($\bar{G}0.70$) at 68°F with intermittent agitation.



High Contrast

ORTHO Plus copy film developed in ILFORD MULTIGRADE Paper Developer (1+9) for 3½ minutes ($\bar{G}0.85$) and 7½ minutes ($\bar{G}1.2$), at 68°F with intermittent agitation.



ORTHO PLUS

DEVELOPMENT TIMES

The tables give development times for both manual and machine processing of ILFORD ORTHO Plus film. These times will produce various different contrasts and are intended as a GUIDE ONLY.

For manual processing, these times are based on intermittent agitation. When continuous agitation is used reduce these times by up to 15%.

TRAY, DEEP TANK AND ROTARY PROCESSORS (MIN./68°F/20°C) PICTORIAL CONTRAST

ILFORD Developer	Dilution	Contrast	
		$\bar{G}$ 0.62	$\bar{G}$ 0.70
ILFOSOL-S	1+9	4½*	6
ILFOTEC HC	1+15	4*	5
	1+31	6	8
ID-11	Stock	8	10
	1+1	10½	13
	1+3	16	20
MICROPHEN	Stock	9	12
	1+1	11½	14½
	1+3	13½	17
PERCEPTOL	Stock	13	16

Non-ILFORD Developer	Dilution	Contrast	
		$\bar{G}$ 0.62	$\bar{G}$ 0.70
Kodak D-76	Stock	8	10
	1+1	10½	13
Kodak T-Max	1+4	5	6½

*Not recommended due to risk of uneven development.

HIGH CONTRAST

ILFORD Developer	Dilution	Contrast	
		$\bar{G}$ 0.85	$\bar{G}$ 1.20
MULTIGRADE Paper Developer	1+9	3½	7½

DESCRIPTION

ILFORD SFX 200 is a medium speed black and white camera film for creative photography. It has extended red sensitivity (up to 740nm) and is especially suited for use with a filter to create special effects. Using a deep red filter, for example, skies can be rendered almost black and most green vegetation almost white. Its unusual tonal rendition ensures interesting results for a range of subjects, including portraits, landscapes, townscapes and architecture. SFX 200 also has full panchromatic sensitivity to ensure good pictorial contrast with or without the use of a filter. It has a wide exposure latitude, is compatible with all normal developers and has a wide tonal range.

SFX 200 is coated on 0.125mm (5mil) acetate base that gives good halation protection. It is available in 35mm 36-exposure DX-coded cassettes and 120 roll film.

EXPOSURE RATING

SFX 200 has a speed rating of ISO 200/24° (200ASA, 24DIN, EI 200/24) to daylight. The ISO speed rating was measured using ILFORD ID-11 developer at 68°F with intermittent agitation in a spiral tank.

It should be noted that the exposure index (EI) range recommended for SFX 200 is based on a practical evaluation of film speed and is not based on foot speed, as is the ISO standard.

USE OF FILTERS WITH SFX 200 FILM

Any yellow, orange or red filter may be used, but the effect will depend on its transmission characteristics. The redder the filter, the more dramatic the effect. Suggested filters include:

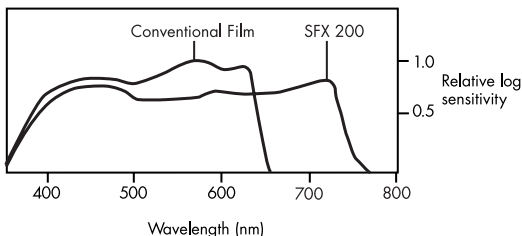
Very Dark Red ILFORD SFX 'P', 'A' and Cokin 'P' series mounted filter, B+W 092, Heliopan RG695, Hoya R72 and Kodak Wratten 89B. These filters give an even more dramatic effect than dark red filters. However, exposure times with these filters can be very long, so the use of a tripod is recommended.

Dark Red B+W 091, Heliopan 29 and Kodak Wratten 29. These filters give a more dramatic effect than light red filters.

Light Red B+W 090, Cokin 003, Heliopan 25, Hitech 25, Hoya 25A, Kodak Wratten 25 and Lee 25. Under some conditions, the effect with these filters can be quite subtle – similar to a normal panchromatic film used with these filters.

SPECTRAL SENSITIVITY

Wedge spectrogram to tungsten light (2850K)



SFX 200 has a peak red sensitivity at 720nm and extended red sensitivity up to 740nm.

LOADING THE CAMERA

SFX 200 must be loaded in subdued light. Unlike true infrared film, it is not necessary to load it in total darkness.

FOCUSING

With some lenses, red light focuses at a slightly different point than other visible light. With these lenses there may be a focus shift when focusing in white light compared with red light. However, it is almost impossible to focus a camera with a deep red filter in place.

With short to moderate focal length lenses, this difference can easily be accommodated by stopping down the lens to the smallest workable aperture. Some lenses, particularly apochromatic (APO) designs, may need no correction.

EXPOSURE

A certain amount of experimentation is needed when first using this film. As a guide, bracket exposures by ± 2 stops from the TTL reading with the filter in place.

NOTE: The TTL metering on some cameras can underexpose by up to 1½ stops with deep red or orange filters in place.

If you want to check the TTL metering system on your camera before starting, set the metering system of the camera to EI 200/24 and, with your filter in place, make a series of exposures up to ± 2 stops from the indicated exposure. After processing, decide which is the best negative and re-set the camera, if necessary.

CHOOSING THE BEST ILFORD DEVELOPER FOR THE JOB Manual Processing (e.g., Spiral Tank, Deep Tank)

Requirement	Liquid	Powder
Best Overall Image Quality at Meter Setting:		
EI 200/24	ILFOTEC DD-X (1+4)	ID-11 (Stock)
EI 400/27	ILFOTEC DD-X (1+4)	ID-11 (Stock)
EI 800/30	ILFOTEC DD-X (1+4)	ID-11 (Stock)
Finest Grain	ILFOTEC DD-X (1+4)	PERCEPTOL (Stock)
Maximum Sharpness	ILFOSOL S (1+9)	ID-11 (1+1)
Maximum Film Speed	ILFOTEC HC (1+15)	MICROPHEN (Stock)
One-Shot Convenience	ILFOSOL S (1+9)	ID-11 (1+1) MICROPHEN (1+1)
Economy		ID-11 (1+1) MICROPHEN (1+1)
Rapid Processing	ILFOTEC HC (1+15)	
Replenishable	ILFOTEC HC	

Machine Processing

Dip and Dunk	ILFOTEC DD	Best overall image quality and long tank life
	ILFOTEC HC	Flexible process time, range of dilutions and economy
Leader Belt	ILFOTEC RT RAPID	Rapid processing, best overall image quality and long tank life
	ILFOTEC HC	Range of dilutions, flexibility & economy
Roller Transport	ILFOTEC RT RAPID	Rapid processing

For complete development times, see chart on pages 46 and 50.

For detailed processing information see page 40.

FILTER FACTORS

FILTER FACTORS

ILFORD films can be used with all types of filters (e.g., color, polarizing and neutral density filters) in the usual way.

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.

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 underexposed by as much as 1½ stops.

PROCESSING

B&W FILM

PROCESSING THE RANGE OF ILFORD FILMS IN SPIRAL TANKS, TRAYS AND ROTARY PROCESSORS WITHOUT REPLENISHMENT

SAFELIGHT RECOMMENDATIONS

Handle ILFORD films 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 ILFORD films 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.

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.

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 the Film/Chemical Processing Charts on pages 44-51; 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. Generally, however, a pre-rinse is not always necessary and may lead to uneven processing.

MACHINE PROCESSING

ILFORD films 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 “Choosing the Best ILFORD Developer for the Job” section for each film.

After development, fix ILFORD films in ILFORD HYPAM Fixer. When roller transport processing add one part HYPAM Fix Hardener* to

PROCESSING

B&W FILM

every 40 parts working strength HYPAM Fixer. Hardener protects the film during the remainder of the roller transport processing sequence.

*ILFORD HYPAM Fix Hardener CANNOT be used with ILFORD RAPID FIXER or ILFORD 2000 RT Fixers.

DEVELOPMENT

Development times are given on the chart beginning with page 44.

The recommended development times for ILFORD films 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 needed.

For manual processing in spiral tanks, the development times are based on intermittent agitation – see 'Spiral Tank Processing'. Where continuous agitation is used for manual processing without a pre-rinse (as in a tray or with some types of developing tanks), reduce these times by up to 15%.

NOTE: Development times may need adjusting to suit individual processing systems and working practices. Development times in other manufacturers' developers are included for your convenience and are only a general guide. Adjust these times to suit your processing system. Other manufacturers can and do change their product specifications from time to time, and the development times may change as a result.

DILUTE DEVELOPMENT

Development of ILFORD films in dilute or one-shot developers may be preferred for convenience and economy. In most cases, diluted developer should be used once only and then discarded.

Dilute development with intermittent agitation further increases the sharpness of ILFORD films, but it can also increase grain with some developers.

PROCESSING

For best results when processing film, solutions, including wash water, should always be kept at similar temperatures ($\pm 10^{\circ}\text{F}$).

Always ensure that at least the minimum amount of working strength developer is used when processing, otherwise film will be under-developed. The minimum amount of working strength developer for one 35mm 36-exposure film is 100ml, although more solution may be required for complete coverage. One 35mm 36-exposure film (520cm²) is equivalent to one-and-a-half 24-exposure 35mm films, one 120 roll film, half 220 roll film, one 8x10 inch sheet or four 4x5 inch sheets of film.

PROCESSING

B&W FILM

FIXING

Use the standard ILFORD recommendations for agitation when fixing ILFORD films—see 'Spiral Tank Processing' and 'Rotary Processors' sections. For best results, it is advisable to give DELTA PROFESSIONAL films slightly longer fixing times than usual.

After development, rinse films in water and fix ILFORD Plus films in ILFORD RAPID FIXER diluted 1+4 for 2 - 4 minutes and ILFORD DELTA PROFESSIONAL films for 3 - 5 minutes at 68°F. If ILFORD HYPAM Fixer with ILFORD HYPAM Fix Hardener* is used, 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 HYPAM Fix Hardener **CANNOT** be used with ILFORD RAPID FIXER or ILFORD 2000 RT fixers.

WASHING

When a non-hardening fixer such as ILFORD RAPID FIXER 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 recommended. This 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 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 a few drops of ILFOTOL Wetting Agent (1+199) has been added will aid rapid and uniform drying.

PROCESSING

B&W FILM

DRYING

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

STORAGE

In common with all film, store unexposed ILFORD films in a cool (50° - 68°F/10° - 20°C), 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.

STORAGE OF EXPOSED FILM

As with any film, once exposed, process ILFORD films 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.

NEGATIVE STORAGE

Store processed negatives in a cool (50° - 68°F/10° - 20°C), 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 plasticizer used may affect the film and cause it to stick to the negative sleeves.

PRINTING FROM ILFORD FILM NEGATIVES

ILFORD films give negatives with superb image quality which will ensure excellent quality prints, even from subjects with a wide brightness range. ILFORD films are 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 600 exposing system replaces the standard lamphouse on most professional enlargers and ensures fast and efficient printing on MULTIGRADE papers.

ILFORD FILM/CHEMICAL PROCESSING CHART

ALL FILM CHEMICALS &
DILUTIONS AT 68°F
(unless otherwise noted)

		ILFORD ID - 11			ILFORD ILFOTEC HC			ILFORD ILFOSOL S	
		STOCK	1+1	1+3	1+15	1+31	1+47	1+9	1+14
PAN F PLUS									
ALL FORMATS	EI 25	6½	8½	14					
	EI 50	6½	8½	15			5½	6	
	EI 100								
	EI 200								
FP4 PLUS									
ALL FORMATS	EI 50	6½	8	17	6	8		7½	
	EI 125	8½	11	20	8	12		6½	9½
	EI 200	10	15		5	9		7½	
HP5 PLUS									
ALL FORMATS	EI 200								
	EI 400	7½	13	20	6½	9		7	9½
	EI 800	10½	16½		5	9½		8½	14
	EI 1600	14			7½	14		14	
	EI 3200				11				
SFX 200									
ALL FORMATS	EI 200	10	17		5	9	11	9½	13
	EI 400	14			7	13		11½	19
	EI 800	18			10½	19		19	

DEVELOPMENT TIME

Follow the recommended times in the chart for the film/developer combination of your choice.

CAUTION: These times are intended as a guide only. Times shorter than 5 minutes risk uneven development and are not recommended.

AGITATION

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. For rotary drum processing, use manufacturer's instructions.

ILFORD MICROPHEN			ILFORD PERCEPTOL			ILFORD ILFOTEC DD-X	
STOCK	1+1	1+3	STOCK	1+1	1+3	1+4	
	6	11	9	10½	15	7	
	6	11	14	15	17	8	
8							
12							
			9	13	17	8	
8	10	14	12	15	21	10	
9	14	18				12	
			11				
6½	12	23	11	15	25	9	
8	15					10	
11						13	
16						20	
8½	15½		14½	20		10	
10½	19					14	
14½							

STOP BATH

Use plain water for 15–30 seconds with constant agitation.

FIXER

Fix ILFORD films in ILFORD RAPID FIXER diluted 1+4 for 2–4 minutes. DELTA PROFESSIONAL films require a fixing time of 3–5 minutes.

WASHING

Wash all films for 10 minutes in running water. A final rinse in water to which ILFORD Wetting Agent (1+199) has been added will aid rapid and uniform drying. Hang to dry.

ILFORD FILM/CHEMICAL PROCESSING CHART

ALL FILM CHEMICALS &
DILUTIONS AT 68°F
(unless otherwise noted)

		ILFORD ID-11			ILFORD ILFOTEC HC			ILFORD ILFOSOL S	
		STOCK	1+1	1+3	1+15	1+31	1+47	1+9	1+14
100 DELTA PRO									
ALL FORMATS	EI 50	7	10	15	5	5½		6½	
	EI 100	8½	11	20	6	7½		6	10
	EI 200	10½	13		8	10			
DELTA 400 PRO									
ALL FORMATS	EI 200	7	10	18	5			6½	10
	EI 400	9½	14		7½			9	13
	EI 500								
	EI 800	11½	17½		5½	10		14	
	EI 1600	14½			7½	13½			
	EI 3200	19			13				
DELTA 3200 PRO									
ALL FORMATS	EI 400	7			6			6½	
	EI 800	8			7½			8	
	EI 1600	9½			5	9		10½	
	EI 3200	10½			8	14½		13	
	EI 6400	13			13				
	EI 12500	17							
DELTA 3200 PRO (Times at 75°)									
ALL FORMATS	EI 400	6			5			5½	
	EI 800	7			5½	6		6½	
	EI 1600	8			7			8½	
	EI 3200	9			5½	10½		10½	
	EI 6400	11			8½				

ILFORD MICROPHEN			ILFORD PERCEPTOL			ILFORD ILFOTEC DD-X	
STOCK	1+1	1+3	STOCK	1+1	1+3	1+4	
			12	13	16	9½	
6½	10	14	15	17	22	12	
8	14	20				14	
5	8½	16	10	12½	18½	6	
6½	11½					8	
7½	13½					9½	
8½	15½					10½	
10½	19					13½	
14						18	
6			11			6	
7			13			7	
8			15			8	
9			18			9½	
12						12½	
16½						17	
			9½				
5			10½			5	
6			12			6	
7			15½			7	
9½						9	

ILFORD

FILM/CHEMICAL PROCESSING CHART

ALL FILM CHEMICALS & DILUTIONS AT 68°F (unless otherwise noted)		ACUFINE	AGFA RODINAL		KODAK D-76		
		STOCK	1+25	1+50	STOCK	1+1	1+3
PAN F PLUS							
ALL FORMATS	EI 25				6½	10½	15½
	EI 50		6	11	6½	10½	15½
	EI 100						
	EI 200						
FP4 PLUS							
ALL FORMATS	EI 50				6	9	14
	EI 125		9	15	8	11	16
	EI 200	6	13	20	9	15	20
	EI 400						
HP5 PLUS							
ALL FORMATS	EI 200						
	EI 400		6	11	7½	11	22
	EI 800	6½	8		9½	13	
	EI 1600	9½			12½		
	EI 3200						
SFX 200							
ALL FORMATS	EI 200				10	14½	
	EI 400				12½		
	EI 800				16½		

KODAK HC 110 A 1+15	KODAK HC 110 B 1+31	KODAK XTOL STOCK 1+1	KODAK T-MAX 1+4	KODAK T-MAX RS (at 75°) STOCK
		5½ 6		
		6½ 7		
		7 8½		
		8 10		
	6			
	9	9 11½	8	7½
6	12	9½ 12½	9	
		12 15		
	5	8 12	6½	
	7½	11 17	8	5
5½	11	14	9½	7
9½		19	11½	10½
5	9	10 14½	8½	6
	13	12½ 17½	10½	7
	19	15½ 22	12½	9

ILFORD FILM/CHEMICAL PROCESSING CHART

ALL FILM CHEMICALS
& DILUTIONS AT 68°F
(unless otherwise noted)

ACUFINE

STOCK

AGFA RODINAL

1+25

1+50

KODAK D-76

STOCK

1+1

1+3

100 DELTA PRO

ALL FORMATS	EI 50		7	10	7	9½	14
	EI 100		9	14	9	12	22
	EI 200	5½			11	14	
	EI 400						

DELTA 400 PRO

ALL FORMATS	EI 200	7	6½	11	7	10	18
	EI 400	9	9	20½	9½	14	
	EI 500	11					
	EI 800	13			11½	17½	
	EI 1600	16			14½		
	EI 3200				19		

DELTA 3200 PRO

ALL FORMATS	EI 400	5½	7	
	EI 800	7	8	
	EI 1600	9	9½	
	EI 3200	11	10½	
	EI 6400	20	13	
	EI 12500		17	

DELTA 3200 PRO

(Times at 75°)

ALL FORMATS	EI 400		6	
	EI 800		7	
	EI 1600	5½	8	
	EI 3200	7½	9	
	EI 6400	15	11	

KODAK HC 110 A 1+15		KODAK HC 110 B 1+31		KODAK XTOL STOCK 1+1		KODAK T-MAX 1+4		KODAK T-MAX RS (at 75°) STOCK	
		5		6	8	6		5	
		6		7½	9½	7		6	
		8		8½	11	8		8	
				10½	12½				
				6	9	5			
		7½		7½	11½	6½			
				8½	13	7			
5½	10			10	15½	8½			
7½	13½			13	20	10½			
13				17		13½			
		6		5		5½			
		7½		6		6½			
5	9			6½		7½			
8	14½			7½		8½			
13				10		11			
				12½		14			
		5							
		6		5½		5½			
		7		6		6½		5	
5½	10½			7		7½		6½	
8½				9		9½		8½	

TEMPERATURE CONVERSION CHART

To use, find the recommended or normally used development time at 68°F. Follow the row left or right, until it matches the new temperature column.

For example, if 8 minutes at 68°F is recommended, the time at 75°F will be 5.5 minutes.

**DEVELOPMENT TIMES
BELOW 5 MINUTES ARE
NOT RECOMMENDED DUE
TO THE RISK OF UNEVEN
DEVELOPMENT.**

Note: This chart does not apply to
DELTA 3200 PROFESSIONAL

64°F	66°F	68°F	70°F	72°F	75°F	77°F	80°F
5.0	4.5	4.0	3.5	3.25	2.5	*	*
5.5	5.0	4.5	4.0	3.75	3.0	*	*
6.0	5.5	5.0	4.5	4.0	3.25	*	*
6.5	6.0	5.5	5.0	4.5	3.5	*	*
7.25	6.5	6.0	5.5	5.0	4.0	3.75	*
8.0	7.25	6.5	6.0	5.25	4.5	4.0	3.5
8.75	7.75	7.0	6.5	5.75	5.0	4.5	3.75
9.25	8.25	7.5	6.75	6.0	5.25	4.75	4.0
9.75	8.75	8.0	7.25	6.5	5.5	5.0	4.25
10.5	9.5	8.5	7.75	7.0	6.0	5.5	4.75
11.25	10.0	9.0	8.0	7.25	6.25	5.75	5.0
11.75	10.5	9.5	8.5	7.75	6.5	6.0	5.25
12.5	11.25	10.0	9.0	8.0	7.0	6.25	5.5
13.0	11.75	10.5	9.5	8.5	7.25	6.5	5.75
13.75	12.25	11.0	10.0	9.0	7.5	6.75	6.0
14.25	12.75	11.5	10.5	9.25	8.0	7.25	6.25
14.75	13.25	12.0	10.75	9.75	8.25	7.5	6.5
15.25	13.75	12.5	11.25	10.0	8.75	8.0	7.0
16.0	14.5	13.0	11.75	10.5	9.0	8.25	7.0
16.75	15.0	13.5	12.0	11.0	9.25	8.5	7.25
17.25	15.5	14.0	12.5	11.25	9.75	9.0	7.75
17.75	16.0	14.5	13.0	11.75	10.0	9.0	7.75
18.5	16.75	15.0	13.5	12.25	10.5	9.5	8.0
19.25	17.25	15.5	14.0	12.75	10.75	9.75	8.25
19.75	17.75	16.0	14.5	13.0	11.0	10.0	8.5
20.5	18.5	16.5	14.75	13.5	11.5	10.25	8.75
21.0	19.0	17.0	15.25	13.75	11.75	10.5	9.0
21.75	19.5	17.5	15.75	14.25	12.0	10.75	9.25
22.25	20.0	18.0	16.25	14.5	12.5	11.25	9.75
22.75	20.5	18.5	16.75	15.0	12.75	11.5	9.75
23.5	21.0	19.0	17.25	15.5	13.25	12.0	10.25
24.25	21.75	19.5	17.5	16.0	13.5	12.25	10.5
24.75	22.25	20.0	18.0	16.25	13.75	12.5	10.75
25.25	22.75	20.5	18.5	16.75	14.25	12.75	11.0
26.0	23.5	21.0	19.0	17.0	14.5	13.0	11.25
26.5	23.75	21.5	19.5	17.5	15.0	13.5	11.5
27.25	24.5	22.0	19.75	17.75	15.25	13.75	11.75
27.75	25.0	22.5	20.25	18.25	15.5	14.0	12.0
28.25	25.5	23.0	20.75	18.75	16.0	14.5	12.5
28.75	26.0	23.5	21.0	19.0	16.25	14.75	12.75
29.75	26.75	24.0	21.75	19.5	16.75	15.0	13.0
30.25	27.25	24.5	22.0	19.75	17.0	15.25	13.0
30.75	27.75	25.0	22.5	20.25	17.25	15.5	13.25

ILFORD

BLACK & WHITE FILM CHEMICALS

ID-11 DEVELOPER

ID-11 Developer is a clean-working, general purpose powder developer for all films. It is recommended for processing films at their rated speed. Films processed in ID-11 Developer yield excellent sharpness, medium contrast, fine tonal rendition and excellent highlight and shadow detail.

MICROPHEN DEVELOPER

MICROPHEN Developer is a fine-grain, high-energy powder developer that provides an effective increase in film speed. It offers a high speed/grain ratio and reduced grain size due to low alkalinity. It is clean-working and recommended for push processing.

PERCEPTOL DEVELOPER

PERCEPTOL Developer is an extra fine-grain powder developer that offers excellent image quality. It is the ideal developer to use when texture and definition are critical or when films are shot below their recommended ISO rating. PERCEPTOL is slow-working for excellent speed control.

ILFOTEC DD-X

ILFOTEC DD-X is the hobbyist & semipro version of our Pro ILFOTEC DD Developer. ILFOTEC DD-X is a fine grain developer which gives full film speed. Correctly exposed negatives developed in ILFOTEC DD-X have a full range of tones, with depth in the shadows, a smooth transition through the mid-tones and bright, detailed highlights. ILFOTEC DD-X works especially well with DELTA 3200 PROFESSIONAL Films, rated at EI 3200/36.

ILFOSOL S FILM DEVELOPER

ILFOSOL S is a liquid developer designed for one-shot use. It offers fine grain with full film speed and excellent tonal rendition. It is also economical and convenient to mix.

ILFOTEC HC DEVELOPER

ILFOTEC HC Developer is a highly concentrated fine-grain liquid developer designed for one-shot use in deep tank, reel and cine processors. It offers high-quality, sharp results with very little grain. ILFOTEC HC Developer is clean-working and may be replenished with ILFOTEC HC Replenisher.

ILFORD

BLACK & WHITE FILM CHEMICALS

ILFOTEC DD FILM DEVELOPER

ILFOTEC DD Film Developer is an excellent developer for use in dip and dunk and deep tank processors. It is compatible with both conventional and newer generation black and white films. It offers fine grain and is great for maintaining highlight details with difficult to process black and white films. ILFOTEC DD is also readily usable for push processing.

ILFOTEC RT RAPID DEVELOPER

ILFOTEC RT RAPID is a developer/replenisher for developing all general purpose black and white films. It is specifically designed for roller transport or leader card film processors, both of which require short development times through processing temperatures which are usually about 79°F/26°C. It offers fine grain and full film speed. ILFOTEC RT RAPID has a long working life.

NEW ILFORD RAPID FIXER

ILFORD RAPID FIXER is a rapid-acting, non-hardening ammonium thio-sulfate fixer for use with all films and papers. It is **not** compatible with hardeners.

NEW HYPAM FIXER

HYPAM Fixer is an economical, liquid, non-hardening rapid fixer for film and paper processing. HYPAM Fixer is fully compatible with hardeners.

NEW ILFORD HYPAM FIX HARDENER

ILFORD HYPAM Fix Hardener is a liquid hardener for use in HYPAM Fixer when films are machine processed.

Note: UNIVERSAL RAPID and MULTIGRADE Fixers have been discontinued.

DEVELOPER APPLICATIONS AND FEATURES

DEVELOPER APPLICATIONS

	LIQUID		
	ILFOTEC DD-X	ILFOTEC HC	ILFOSOL S
Spiral Tank	●	○	●
Tray	●	○	●
Rotary Processor	●	○	●

DEVELOPER FEATURES

	LIQUID		
	ILFOTEC DD-X	ILFOTEC HC	ILFOSOL S
General Purpose	●	●	●
Fine Grain	●	●	○
High Sharpness	●	○	●
Push Processing	●	●	—
Economy	○	●	○
Ease of Use	●	○	●
Shelf Life	●	●	○

● Excellent

○ Good

— Not recommended

POWDER		
ID-11	MICROPHEN	PERCEPTOL
●	●	●
●	●	●
●	●	●
POWDER		
ID-11	MICROPHEN	PERCEPTOL
●	○	—
○	—	●
●	●	○
○	●	—
●	●	●
○	○	○
●	●	●

ILFORD

BLACK & WHITE FILM CHEMICALS

WITHOUT REPLENISHMENT OR REUSE

One liter of working strength solution will process the following number of films:

Solution	35mm 36 exp	35mm 24 exp	120 Roll Film	220 Roll Film	4x5 Sheet	8x10 Sheet
Developers						
ILFOTEC DD-X (1+4)*	10	15	10	5	40	10
ILFOTEC HC (1+15)*	10	15	10	5	40	10
ILFOTEC HC (1+31)*	5	7.5	5	2.5	20	5
ILFOSOL S* (1+9)	5	7.5	5	2.5	20	5
ID-11 (Stock)	10	15	10	5	40	10
ID-11 (1+1)	5	7.5	5	2.5	20	5
MICROPHEN (Stock)	10	15	10	5	40	10
MICROPHEN (1+1)	5	7.5	5	2.5	20	5
PERCEPTOL (Stock)	5	7.5	5	2.5	20	5
PERCEPTOL (1+1)	2.5	3.75	2.5	1.25	10	2.5
Other Solutions						
ILFOSTOP (1+19)*	15	20	15	8	60	15
ILFORD RAPID FIXER (1+4)*	24	36	24	12	96	24

*Dilutions from concentrate

Above capacities assume 200ml (6.8 oz.) of solution per roll

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ILFORD

BLACK & WHITE PAPERS

MULTIGRADE IV RC DELUXE is our highest-quality variable contrast resin coated paper. It produces full tonal gradation and superb image quality across its wide contrast range – equivalent to grades 00 - 5. MULTIGRADE IV RC DELUXE also produces highlight detail that is unsurpassed by any other variable contrast paper. It is NOT developer incorporated and can be processed in trays or conventional processors. It is available in glossy, pearl, and satin surfaces.

MULTIGRADE IV RC PORTFOLIO offers all the same advanced printing characteristics as MULTIGRADE IV RC DELUXE on a double-weight resin coated base. Prints made on MULTIGRADE IV RC PORTFOLIO have a premium feel when compared to other normal medium-weight RC papers. It is available in glossy and pearl surfaces.

MULTIGRADE RC WARMTONE is a premium-quality, medium-weight variable contrast black and white paper on a resin coated base. It has a warm black image tone on a warm white base. MULTIGRADE RC WARMTONE is receptive to a wide range of toners, and can be toned to provide subtle color changes or dramatic effects. It is available in glossy and pearl surfaces.

MULTIGRADE RC COOLTONE is a premium-quality, variable contrast paper on a resin coated base. Its clean white base and cool black tones offer crisp, sharp prints with high dramatic impact. It is available in glossy and pearl surfaces.

ILFOSPEED RC DELUXE is a graded resin coated paper that produces prints with superb image quality. All three grades have dense blacks and clean whites, and grades are evenly spaced across the contrast range. ILFOSPEED RC DELUXE features short exposure times and can be processed in trays and conventional processors. It is available in glossy and pearl surfaces.

ILFORD

BLACK & WHITE PAPERS

MULTIGRADE IV FB FIBER is a premium-quality variable contrast paper with a baryta coated fiber base. The emulsion is similar to that of MULTIGRADE IV RC DELUXE in its ability to produce maximum highlight detail while retaining shadow detail. However, the MULTIGRADE IV FB FIBER emulsion has been modified to meet the needs of demanding fiber printers. It is available in double-weight glossy and matt surfaces.

MULTIGRADE FB WARMTONE is a premium-quality fiber base paper that offers a true warm image color, creamy whites and deep velvety blacks. It is wonderfully responsive to a whole range of toning solutions, allowing printers the ability to achieve a variety of toning effects. It is available in double-weight glossy and semi-matt surfaces.

ILFOBROM GALERIE FB is a premium-quality graded paper on a baryta coated double-weight fiber base. Available in grades 1 - 4, ILFOBROM GALERIE FB is the material of choice for printers who demand the highest possible standards of image quality and permanence. It is available in glossy and matt surfaces.

PAPER APPLICATIONS AND FEATURES

PAPER APPLICATIONS

Application	MULTIGRADE IV RC DELUXE	MULTIGRADE IV RC PORTFOLIO	MULTIGRADE RC WARMTONE
Advertising	●	●	●
Commercial/Industrial	●	●	●
Exhibitions/Displays	●	●	●
Commercial Permanence	●	●	●
Archival Permanence	○	○	○
Fine Art	◐	◐	◐
General Purpose	●	○	○
Murals	◐	○	○
Photofinishing	◐	◐	◐
Press	●	◐	◐

● Highly Recommended ◐ Recommended ○ Suitable — Not Recommended

PAPER FEATURES

Feature	MULTIGRADE IV RC DELUXE	MULTIGRADE IV RC PORTFOLIO	MULTIGRADE RC WARMTONE
Variable Contrast	●	●	●
Graded			
Resin Coated (Medium Wgt.)	●		●
(Double Wgt.)		●	
Fiber Base (Double Wgt.)			
Machine Processing	●	●	●
Tray Processing	●	●	●

MULTIGRADE RC COOLTONE	MULTIGRADE IV FB (FIBER)	MULTIGRADE FB WARMTONE	ILFOSPEED RC DELUXE	ILFOBROM GALERIE FB
●	●	●	⊙	●
●	●	●	⊙	⊙
●	●	●	⊙	●
○	●	●	○	●
⊙	●	●	○	●
●	●	⊙	●	○
—	⊙	⊙	⊙	⊙
—	—	—	⊙	—
⊙	○	○	●	—

MULTIGRADE RC COOLTONE	MULTIGRADE IV FB (FIBER)	MULTIGRADE FB WARMTONE	ILFOSPEED RC DELUXE	ILFOBROM GALERIE FB
●	●	●		
			●	●
●			●	
	●	●		●
●			●	
●	●	●	●	●

MULTIGRADE IV RC DELUXE & PORTFOLIO

DESCRIPTION

ILFORD MULTIGRADE IV RC DELUXE is a variable contrast, black and white, non-developer incorporated photographic paper on a medium-weight resin coated base. It is a premium-quality paper that produces prints with deep rich blacks and a neutral image color on a bright white base.

ILFORD MULTIGRADE IV RC DELUXE black and white paper has been improved to give an even higher level of performance and quality. Compared with MULTIGRADE III, it has better tonal rendition throughout the contrast range, especially in the highlights.

MULTIGRADE IV RC PORTFOLIO is a resin coated variable contrast black and white paper with identical image properties to MULTIGRADE IV RC DELUXE but coated on a double-weight (250g/m²) RC base.

MULTIGRADE IV RC DELUXE and MULTIGRADE IV RC PORTFOLIO can be processed in trays or in automatic paper processors. However, because they are not developer incorporated they are not recommended for activation/stabilization-type processors. They are available in 1M glossy and 44M pearl surfaces. MULTIGRADE IV RC DELUXE is also available in 25M satin surface.

EXPOSURE

MULTIGRADE IV RC DELUXE and PORTFOLIO are designed for use with all enlargers.

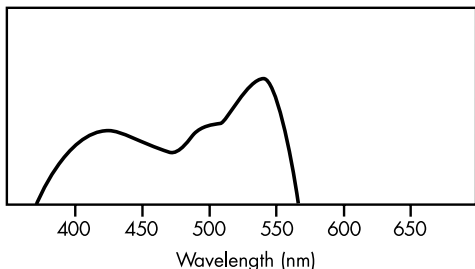
SAFELIGHT RECOMMENDATIONS

MULTIGRADE IV RC papers can be used with an ILFORD 902 safelight filter (light brown) or a Kodak OC or equivalent, in a safelight lamp fitted with a 15W bulb. For direct lighting, do not expose the paper to the safelight for more than 4 minutes, and the distance between the paper and the safelight should be a minimum of 3 feet.

MULTIGRADE IV RC DELUXE & PORTFOLIO

SPECTRAL SENSITIVITY

The wedge spectrogram of MULTIGRADE IV RC papers, unfiltered, to tungsten light (2850K) is given below.



CONTRAST RANGE

Seven full grades of contrast are available with MULTIGRADE IV RC papers when used with MULTIGRADE filters; six when used with the ILFORD MULTIGRADE 600 Exposure System. Each of these systems allows half grades in addition to full grades. MULTIGRADE IV RC papers unfiltered have an ISO range of R100. The chart gives the ISO range figures (ISO Standard 6846-1992) for MULTIGRADE DELUXE and PORTFOLIO. These figures give a guide to selecting the appropriate grade of paper for a given effective negative density range.

ISO Range

MULTIGRADE IV RC DELUXE and PORTFOLIO with MULTIGRADE Filters

Filter	00	0	1	2	3	4	5
Range (R)	170	150	130	100	80	60	40

The above values refer to tray processing using ILFORD MULTIGRADE Developer and to machine processing in an ILFORD 2650 RC paper processor.

MULTIGRADE IV RC DELUXE & PORTFOLIO

ISO PAPER SPEEDS

(Tray or ILFORD 2650 machine processed)

ILFORD MULTIGRADE IV RC DELUXE and PORTFOLIO—Unfiltered

Paper Speed	500
-------------	-----

ILFORD MULTIGRADE IV RC DELUXE and PORTFOLIO with MULTIGRADE Filters

Filter Number	00	0	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5
Paper Speed	200	.....	.....	.....	.....	.....	.....	.....	200	100	.....	100

LIGHT SOURCE

MULTIGRADE IV RC papers are designed for use with most enlargers fitted with either a tungsten or tungsten halogen light source.

Enlargers with a cold cathode or cold light enlarger head can be used, but the contrast range will vary and is dependent on the spectral characteristics of the light source used. The only way to determine the contrast range available with each model of enlarger is to carry out a practical test. Some additional yellow filtration, up to 70Y, may be helpful in these circumstances.

LATENT IMAGE STABILITY

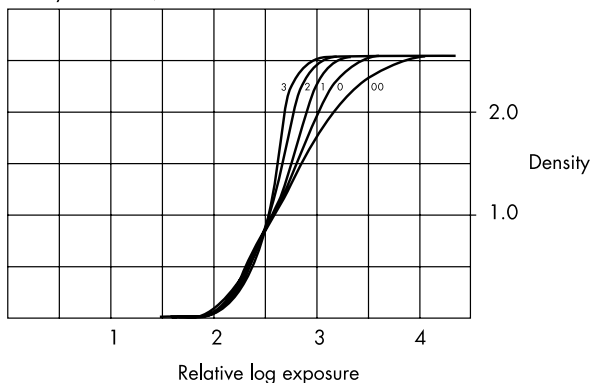
MULTIGRADE IV RC papers have excellent latent image stability. They are especially recommended for all applications that require paper to be left for a reasonable time between exposure and processing. For periods up to 24 hours after exposure, no perceptible change in image quality will be seen.

MULTIGRADE IV RC DELUXE & PORTFOLIO

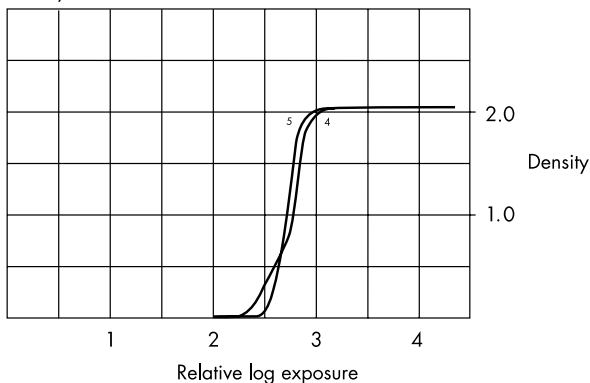
CHARACTERISTIC CURVES

MULTIGRADE IV RC DELUXE and PORTFOLIO glossy or pearl paper exposed through MULTIGRADE filters 00, 0, 1, 2, 3, 4 and 5. Processed in ILFORD MULTIGRADE Developer diluted 1+9 for 1 minute at 68°F (20°C).

Glossy and Pearl, Grades 00–3



Glossy and Pearl, Grades 4 and 5



MULTIGRADE RC WARMTONE

DESCRIPTION

ILFORD MULTIGRADE RC WARMTONE is a premium-quality, variable contrast black and white paper which has a warm black image tone on a warm white base. It is especially suitable for toning. MULTIGRADE RC WARMTONE has a medium weight (190g/m²) resin coated base.

MULTIGRADE RC WARMTONE is part of the ILFORD MULTIGRADE system and is fully compatible with all existing MULTIGRADE filters and equipment. It is equally suitable for printing from conventional black and white and XP2 SUPER negatives.

MULTIGRADE RC WARMTONE is available in two surfaces: 1M glossy and 44M pearl.

EXPOSURE

MULTIGRADE RC WARMTONE is designed for use with all enlargers.

SAFELIGHT RECOMMENDATIONS

MULTIGRADE RC WARMTONE can be used with most common safelights for black and white papers.

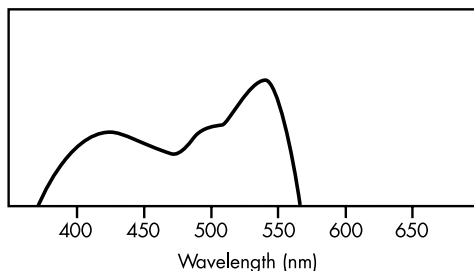
The ILFORD 902 (light brown) safelight filter or Kodak OC or equivalent, fitted in a darkroom lamp with a 15W bulb is recommended.

For direct lighting do not expose the paper to the safelight for more than 4 minutes, and the distance between the paper and the safelight should be a minimum of 3 feet.

MULTIGRADE RC WARMTONE

SPECTRAL SENSITIVITY

Wedge spectrogram of MULTIGRADE RC WARMTONE (unfiltered) to tungsten light (2850K).



CONTRAST RANGE

Seven full grades of contrast, in half grade steps, are available on MULTIGRADE RC WARMTONE paper when used with the ILFORD MULTIGRADE speed-matched filters.

The chart gives the ISO range figures (ISO standard 6846-1992) for MULTIGRADE RC WARMTONE. These figures give a guide to selecting the appropriate grade of paper for a given effective negative density range.

MULTIGRADE RC WARMTONE unfiltered has an ISO range of R110.

ISO Range

MULTIGRADE RC WARMTONE Paper with MULTIGRADE Filters

Filter	00	0	1	2	3	4	5
Range (R)	190	160	130	110	90	70	50

The above values are representative of those obtained when tray processing the paper to ILFORD recommendations.

MULTIGRADE RC WARM TONE

ISO Speed

The speed of MULTIGRADE RC WARM TONE depends on the filtration used during exposure. MULTIGRADE RC WARM TONE unfiltered has a paper speed of ISO P250.

ISO Paper Speed MULTIGRADE RC WARM TONE Paper with MULTIGRADE Filters

Filter	00	0	1	2	3	4	5
Speed (P).....	125	.....	.....	.....	125	64	64

These values are representative of those obtained when tray processing the paper to ILFORD recommendations.

ENLARGER LIGHT SOURCES

MULTIGRADE RC WARM TONE is designed for use with most enlargers and printers, that is, those fitted with either a tungsten or tungsten halogen light source. It is also suitable for use with cold light light sources designed for variable contrast papers. Other cold light and pulsed-xenon light sources may give a reduced contrast range.

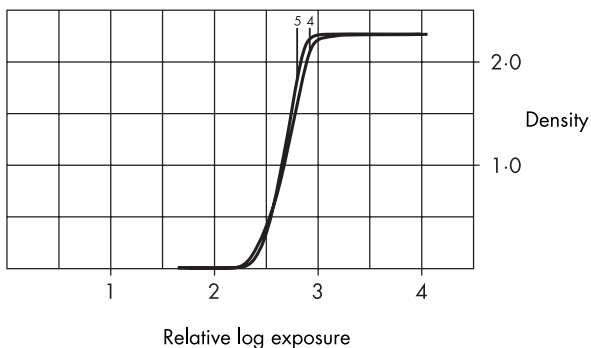
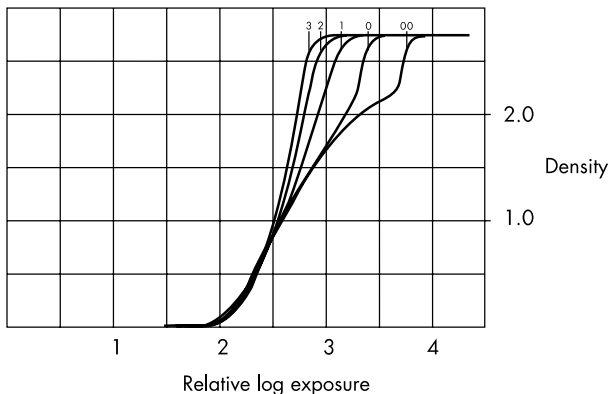
MULTIGRADE RC WARMTONE

CHARACTERISTIC CURVES

MULTIGRADE RC WARMTONE glossy paper exposed through filters 00, 0, 1, 2, 3, 4 and 5.

Developer: MULTIGRADE, diluted 1+9.

DEVELOPMENT: 2 MINUTES AT 68°F (20°C).



MULTIGRADE RC COOLTONE

DESCRIPTION

ILFORD MULTIGRADE RC COOLTONE is a premium quality, variable contrast paper with a cool image tone on a cool white base. MULTIGRADE RC COOLTONE has a medium weight (190g/m²) resin coated base.

MULTIGRADE RC COOLTONE is fully compatible with all existing MULTIGRADE filters and equipment. It is suitable for printing all black and white negatives including ILFORD XP2 SUPER.

MULTIGRADE RC COOLTONE is available in glossy (1M) and pearl (44M) surfaces.

EXPOSURE

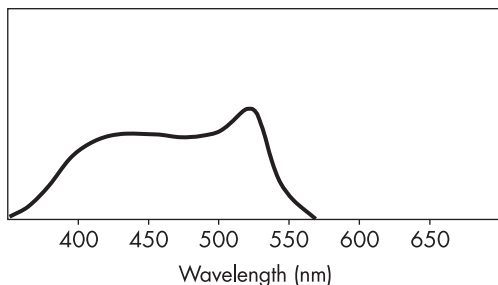
MULTIGRADE RC COOLTONE is designed for use with all enlargers.

SAFELIGHT RECOMMENDATIONS

MULTIGRADE RC COOLTONE can be used with an ILFORD 902 safelight filter (light brown) or a Kodak OC or equivalent, in a safe-light lamp fitted with a 15W bulb. For direct lighting, do not expose the paper to the safelight for more than 4 minutes, and the distance between the paper and the safelight should be a minimum of 3 feet.

SPECTRAL SENSITIVITY

The wedge spectrogram of MULTIGRADE RC COOLTONE paper, unfiltered, to tungsten light (2850K) is given below.



MULTIGRADE RC COOLTONE

CONTRAST RANGE

Seven full grades of contrast are available with MULTIGRADE RC COOLTONE when used with MULTIGRADE filters; six when used with the MULTIGRADE 600 Exposure System. MULTIGRADE RC COOLTONE, unfiltered, has an ISO range of R100. The chart gives the ISO range figures (ISO Standard 6846-1992) for MULTIGRADE RC COOLTONE. These figures give a guide to selecting the appropriate grade of paper for a given effective negative density range.

ISO Range

MULTIGRADE RC COOLTONE with MULTIGRADE filters

Filter	00	0	1	2	3	4	5
Range (R)	180	160	120	100	80	60	50

The above values are representative of those obtained when tray or machine processing to ILFORD recommendations.

ISO SPEED

The speed of MULTIGRADE RC COOLTONE depends on the filtration used during exposure. MULTIGRADE RC COOLTONE unfiltered has a paper speed of ISO P500.

ISO Paper Speed

MULTIGRADE RC COOLTONE paper and MULTIGRADE filters

Filter	00	0	1	2	3	4	5
Speed (P)	200	.....	.....	.....	200	100.....	100

The above values are representative of those obtained when tray or machine processing to ILFORD recommendations.

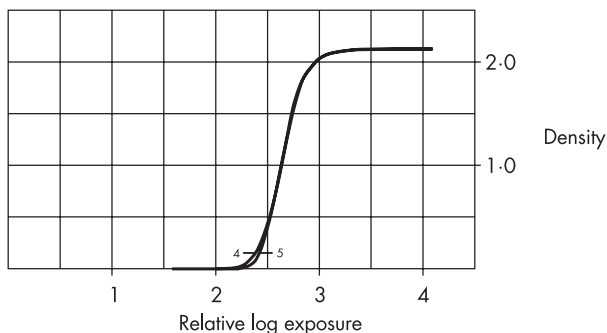
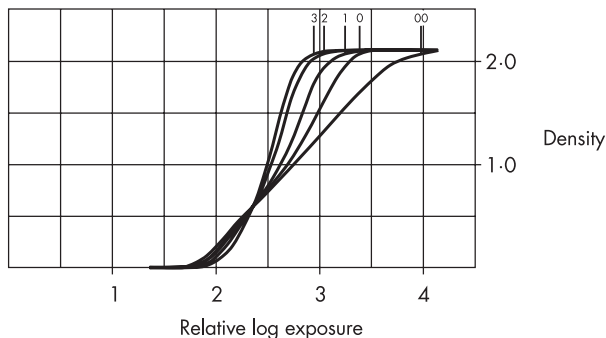
ENLARGER LIGHT SOURCES

MULTIGRADE RC COOLTONE is designed for use with most enlargers that are fitted with either a tungsten or tungsten halogen light source. It is also suitable for use with cold cathode (cold light) light sources designed for variable contrast papers. Other cold cathode and pulsed-xenon light sources may give a reduced contrast range.

MULTIGRADE RC COOLTONE

CHARACTERISTIC CURVES

MULTIGRADE RC COOLTONE glossy or pearl paper exposed through filters 00, 0, 1, 2, 3, 4 and 5. Developed in MULTIGRADE Developer diluted 1+9 for 2 minutes at 68°F(20°C).



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ILFOSPEED RC DELUXE

DESCRIPTION

ILFOSPEED RC DELUXE is a medium-weight, graded RC, black and white paper suitable for a wide range of applications, including commercial, press, industrial, advertising and display work.

This premium-quality paper gives prints with deep, rich blacks, brilliant whites and excellent tonal rendition. ILFOSPEED RC DELUXE has a bright white base tint and a neutral image color in all viewing conditions.

ILFOSPEED RC DELUXE is available in 1M glossy and 44M pearl surfaces.

ILFOSPEED RC DELUXE paper can also be machine processed in automatic processors designed for black and white paper processing. It is not suitable, however, for activation type processing.

EXPOSURE

ILFOSPEED RC DELUXE is designed for use with all enlargers. When using color enlargers, always ensure that the paper is exposed using white light without filtration.

SAFELIGHT RECOMMENDATIONS

Use the ILFORD 902 (light brown) or Kodak OC safelight filter fitted in a darkroom lamp. A 15W bulb is recommended with these safelights. For direct lighting, the distance between the paper and the safelight should not be less than 3 feet.

CONTRAST RANGE

ILFOSPEED RC DELUXE paper is available in three equally spaced contrast grades, sufficient to accommodate most negatives. The following chart gives the ISO range figures (ISO standard 6846 - 1992) for ILFOSPEED RC DELUXE. These figures give a guide to selecting the appropriate grade of paper for a given effective negative density range.

ILFOSPEED RC DELUXE

ISO Range

Grade	0	1	2	3
Range	140	120	100	80

The above values are typical of those obtained by tray processing using ILFORD PQ UNIVERSAL Paper Developer and also by machine processing in an ILFORD RC processor using ILFORD 2000 RT chemicals.

PAPER SPEED

ILFOSPEED RC DELUXE grades 1 - 3 have an ISO paper speed of 500. These values are typical of those obtained by tray processing using UNIVERSAL Paper Developer and also by machine processing in an ILFORD RC processor using ILFORD 2000 RT chemicals.

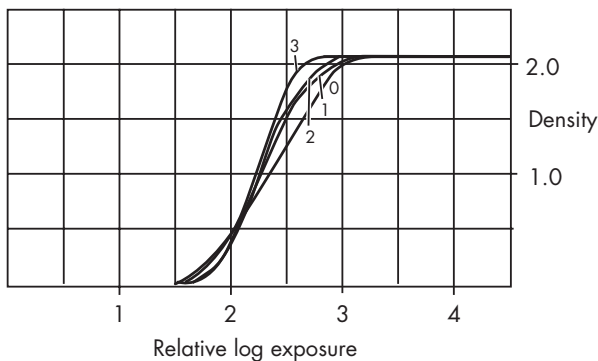
LATENT IMAGE STABILITY

ILFOSPEED RC DELUXE paper can be recommended with confidence for use in all applications that require paper to be left for a reasonable time between exposure and processing. No significant change in picture quality will be seen on these grades when they are left for a period of 24 hours after exposure and before processing.

ILFOSPEED RC DELUXE

CHARACTERISTIC CURVES

Glossy and Pearl



ILFOSPEED RC DELUXE glossy or pearl paper, grades 1 to 3.
Processed in PQ UNIVERSAL Paper Developer diluted 1+9 for 1
minute at 68°F (20°C).

MULTIGRADE IV

FB FIBER

DESCRIPTION

ILFORD MULTIGRADE IV FB Fiber is a premium-quality variable contrast paper on a fiber base. It has been improved to give better tonal rendition throughout the contrast range, especially in the highlights, and has a slightly heavier, double-weight base (255g/m^2).

MULTIGRADE IV FB Fiber gives prints with deep, rich blacks. These are achieved by the careful choice and positioning of optical brighteners in the paper. These same optical brighteners also ensure that the base tint is very clean and bright and remains so, even with prolonged washing. MULTIGRADE IV FB Fiber paper is available in 1K glossy and 5K matt surface.

EXPOSURE

MULTIGRADE IV FB Fiber is designed for use with all enlargers.

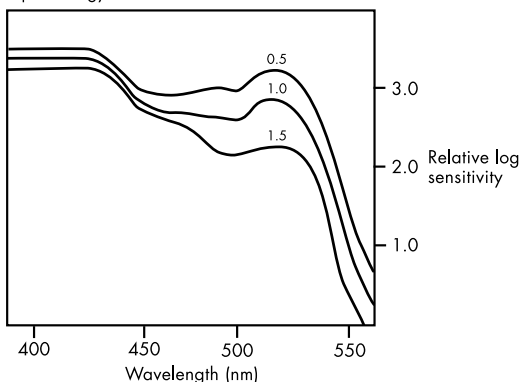
SAFELIGHT RECOMMENDATIONS

Use an ILFORD 902 or Kodak OC safelight filter in a darkroom lamp fitted with a 15W bulb. For direct lighting, the distance between the paper and the safelight should not be less than 3 feet and exposure should not exceed 4 minutes.

SPECTRAL SENSITIVITY

MULTIGRADE IV FB Fiber was tested unfiltered to produce the following curves at density 0.5, 1.0 and 1.5.

Equal Energy



MULTIGRADE IV

FB FIBER

CONTRAST RANGE

Seven full grades of contrast are available with MULTIGRADE IV FB Fiber paper when used with MULTIGRADE filters; six with the ILFORD MULTIGRADE 600 Exposure System. Both of these systems allow half grades in addition to full grades. 12 contrast steps from 00 - 5 are obtainable using MULTIGRADE filters.

The chart gives the ISO range figures (ISO standard 6846 - 1992) for MULTIGRADE IV FB Fiber. These figures give a guide to selecting the appropriate grade of paper for a given effective negative density range.

MULTIGRADE IV FB Fiber unfiltered has an ISO range of R100.

ISO Range

MULTIGRADE IV FB Fiber Paper with MULTIGRADE Filters

Filter	00	0	1	2	3	4	5
Range (R)	170	150	130	100	80	60	40

ISO SPEED

The speed of MULTIGRADE IV FB Fiber depends on the filtration used during exposure. MULTIGRADE IV FB Fiber unfiltered has a paper speed of ISO P500.

ISO Paper Speed

MULTIGRADE IV FB Fiber Paper with MULTIGRADE Filters

Filter	00	0	1	2	3	4	5
Speed (P)	200	.....	.....	.....	200	100	100

The above values are representative of those obtained when tray processing the paper to ILFORD recommendations.

ENLARGER LIGHT SOURCES

MULTIGRADE IV FB Fiber is designed for use with most enlargers and printers, that is, those fitted with either a tungsten or tungsten halogen light source. It is also suitable for use with cold cathode (cold light) light sources designed for variable contrast papers. Other cold cathode (cold light) and pulsed-xenon light sources may give a reduced contrast range.

Enlargers with a cold cathode or cold light head may be used, but

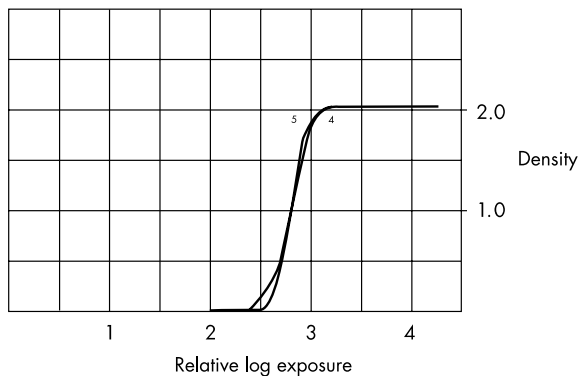
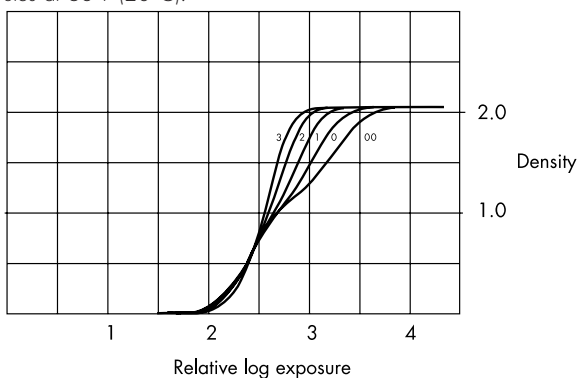
MULTIGRADE IV

FB FIBER

the contrast range will vary and is dependent on the spectral characteristics of the light source used. The only way to determine the contrast range available with each model of enlarger is to carry out a practical test. Some additional yellow filtration, up to 70Y, may be helpful in these circumstances.

CHARACTERISTIC CURVES

MULTIGRADE IV FB Fiber glossy paper exposed through filters 00, 0, 1, 2, 3, 4 and 5. Processed in MULTIGRADE Developer for 2 minutes at 68°F (20°C).



MULTIGRADE FB WARMTONE

DESCRIPTION

ILFORD MULTIGRADE FB WARMTONE is a premium-quality, variable contrast black and white paper that has a warm black image tone on a warm white base. It is especially suitable for toning.

MULTIGRADE FB WARMTONE has a double-weight (255g/m^2) fiber base and is available in 1K glossy and 24K semi-matt surfaces.

EXPOSURE

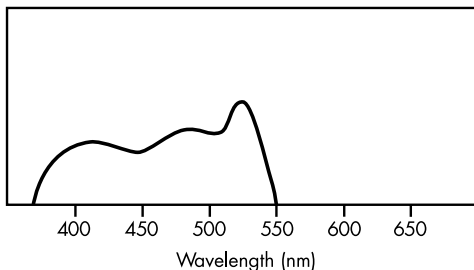
MULTIGRADE FB WARMTONE is designed for use with all enlargers.

SAFELIGHT RECOMMENDATIONS

An ILFORD 902 (light brown) or a Kodak OC safelight filter fitted in a darkroom lamp with a 15W bulb is recommended. For direct lighting do not expose the paper to the safelight for more than 4 minutes, and the distance between the paper and the safelight should be a minimum of 3 feet.

SPECTRAL SENSITIVITY

Wedge spectrogram of MULTIGRADE FB WARMTONE (unfiltered) to tungsten light (2850K).



CONTRAST RANGE

Seven full grades of contrast, in half grade steps, are available on MULTIGRADE FB WARMTONE paper when used with the ILFORD MULTIGRADE filters; six with the MULTIGRADE 600 Exposure System. The chart gives the ISO range figures (ISO Standard 6846-1992) for MULTIGRADE FB WARMTONE. These figures give a guide to selecting the appropriate grade of paper for a given effective negative density range.

MULTIGRADE FB WARMTONE unfiltered has an ISO range of R110.

MULTIGRADE FB WARMTONE

ISO SPEED

The speed of MULTIGRADE FB WARMTONE depends on the filtration used during exposure. MULTIGRADE FB WARMTONE unfiltered has a paper speed of ISO P200.

ISO Paper Speed MULTIGRADE FB WARMTONE with MULTIGRADE Filters

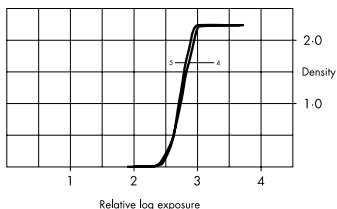
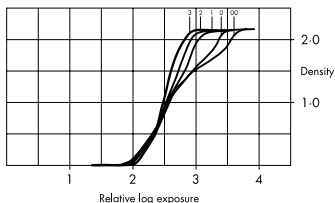
Filter	00	0	1	2	3	4	5
Speed (P)	100	.....	100	50	50		

The above values are representative of those obtained when tray processing the paper to ILFORD recommendations.

ENLARGER LIGHT SOURCES

MULTIGRADE FB WARMTONE is designed for use with most enlargers and printers, that is, those fitted with either a tungsten or tungsten halogen light source. It is also suitable for use with cold cathode (cold light) light sources designed for variable contrast papers. Other cold cathode (cold light) and pulsed-xenon light sources may give a reduced contrast range.

CHARACTERISTIC CURVES



MULTIGRADE FB WARMTONE paper exposed through filters 00, 0, 1, 2, 3, 4 and 5. Processed in MULTIGRADE Developer, diluted 1+9 for 2 minutes at 68°F (20°C).

ILFOBROM GALERIE FB

DESCRIPTION

ILFORD ILFOBROM GALERIE FB is an outstanding quality black and white enlarging paper designed especially for photographers who demand the very highest standards of print quality and permanence.

ILFOBROM GALERIE FB has a white paper base and neutral black image color. It is the paper to use when excellent tonal reproduction is required, not only in the mid-tones but also in the highlight and shadow areas.

ILFOBROM GALERIE FB is a traditional, high-quality, fiber base paper and is available in four grades and two paper surfaces—1K glossy and 5K matt. Both surfaces are designed to give a high-quality finish when air dried, although the glossy surface can be glazed to a high gloss finish. The grades are evenly spaced.

ILFOBROM GALERIE FB is double weight with a nominal thickness of 0.28mm and has an overall weight of 240g/m².

EXPOSURE

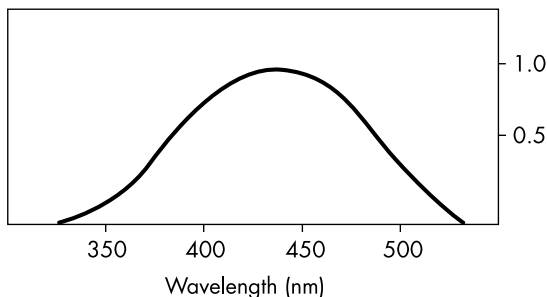
ILFOBROM GALERIE FB is designed for use with all enlargers.

SAFELIGHT RECOMMENDATIONS

Use an ILFORD 902 safelight filter (light brown) or a Kodak OC safelight filter with a 15W bulb with ILFOBROM GALERIE FB enlarging paper. For direct lighting, do not expose the paper to the safelight for more than 4 minutes and the distance between the paper and the safelight should be a minimum of 3 feet.

SPECTRAL SENSITIVITY

Wedge spectrogram to tungsten light (3200K).



ILFOBROM GALERIE FB

CONTRAST RANGE

ILFOBROM GALERIE FB paper is available in four equally spaced contrast grades 1 to 4. The following chart gives the ISO range figures (ISO standard 6846 - 1992) for ILFOBROM GALERIE FB. These figures give a guide to selecting the appropriate grade of paper for a given effective negative density range.

ISO Range

Grade	1	2	3	4
Range	130	110	90	70

The above values are typical of those obtained by tray processing using UNIVERSAL Paper Developer.

PAPER SPEED

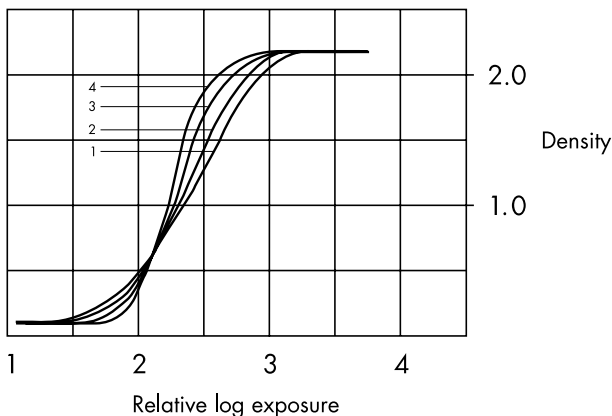
ILFOBROM GALERIE FB has a medium paper speed of ISO P400 for all grades. This speed is representative of that obtained when tray processing ILFOBROM GALERIE FB paper in ILFORD PQ UNIVERSAL Paper Developer. Because all the grades are speed matched, there is no need to alter established exposure times when switching contrast, even when using the maximum contrast grade 4.

The speed of ILFOBROM GALERIE FB has been carefully chosen as a balance between workable exposure times, which allow any creative adjustments to be made, and maximum print output.

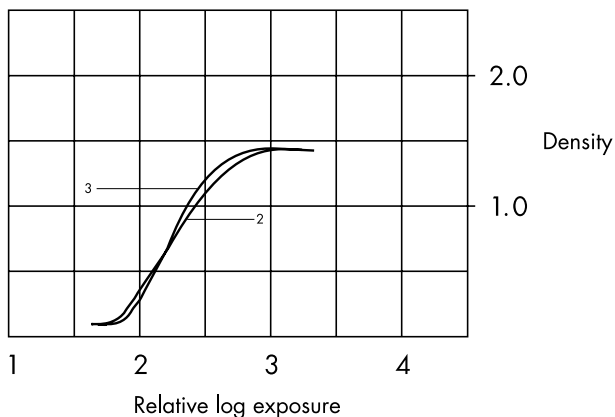
ILFOBROM GALERIE FB

CHARACTERISTIC CURVES

ILFOBROM GALERIE FB 1K glossy



ILFOBROM GALERIE FB 5K matt



CONTRAST CONTROL

CONTRAST CONTROL FOR ILFORD MULTIGRADE VARIABLE CONTRAST PAPERS

Contrast control with ILFORD MULTIGRADE papers can be achieved in several ways. These include MULTIGRADE filters and the MULTIGRADE 600 exposure system. Contrast can also be controlled with other variable contrast enlarger heads and with color enlargers.

MULTIGRADE FILTERS

The 12 MULTIGRADE filters are numbered 00 - 5 in $\frac{1}{2}$ step increments, with the lowest filter number corresponding to the softest contrast.

Filters are available in sets of $3\frac{1}{2} \times 3\frac{1}{2}$ inches and 6x6 inches. They can be used above or below the lens and can be cut to fit the enlarger filter drawer. Filter sizes 12x12 inches are available by special order.

A filter kit is available for below the lens use. The kit is comprised of 12 mounted contrast filters, a mounted safelight filter and a filter holder.

MULTIGRADE filters are very easy to use. No complicated calculations are needed when changing from one filter to another. The exposure time for filters 00 - $3\frac{1}{2}$ is the same; the time for filters 4 - 5 is double.

MULTIGRADE 600 EXPOSURE SYSTEM

The MULTIGRADE 600 enlarger head and exposure control system replaces the standard lamphouse on most professional enlargers. It fits into place with the aid of an adapter kit specially designed for each enlarger.

The MULTIGRADE 600 exposure system is designed to ensure consistent results and is compatible with the Durst L1200, Omega D5, Beseler 45 and De Vere 504 enlargers.

OTHER VARIABLE CONTRAST ENLARGER HEADS

Some manufacturers make variable contrast heads for their enlargers that are specially designed for use with variable contrast papers. Enlarger heads that have been designed in conjunction with ILFORD include those from De Vere, Dunco, Kaiser, Leitz, LPL and Meopta. Follow the instructions provided by the enlarger manufacturer.

USE OF COLOR HEADS

By adjusting the yellow and magenta filtration on color heads, it is possible to obtain a wide contrast range with MULTIGRADE papers.

CONTRAST CONTROL

However, the maximum contrast will be slightly lower as the filters used in color heads are optimized for use with color paper and not with variable contrast paper.

From the table below, select the type of filtration needed according to the enlarger type. The majority of enlarger manufacturers use Durst or Kodak filtration values.

Durst	Kodak
Dunco	Beseler
Durst	Chromega
Kaiser	De Vere
Kienzle	Fujimoto
Leitz	IFF
Lupo	Jobo
	LPL
	Omega
	Paterson
	Simmard
	Vivitar

COLOR FILTER SETTINGS

From the following tables, read off the approximate filtration needed for each contrast step. Dual filtration values usually need longer exposure times than single filtration values but may need less adjustment to exposure times when changing contrast.

Filter Settings

SINGLE FILTER METHOD

ILFORD MULTIGRADE Filters	Durst (Max. 130M)	Durst (Max. 170M)	Kodak	Exposure Factor For Heads
00	120Y	150Y	199Y	2.5
0	70Y	90Y	90Y	2.3
½	50Y	70Y	70Y	2.1
1	40Y	55Y	50Y	1.7
1½	25Y	30Y	30Y	1.4
2	0	0	0	0
2½	10M	20M	5M	1.2
3	30M	45M	25M	1.3
3½	50M	65M	50M	1.6
4	75M	100M	80M	2.0
4½	120M	140M	140M	2.4
5	130M	170M*	199M	2.6

CONTRAST CONTROL

Filter Settings

DUAL FILTER METHOD

ILFORD MULTIGRADE Filters	Durst (Max. 130M)		Durst (Max. 170M)		Kodak	
00	120Y	0M	115Y	0M	162Y	0M
0	88Y	6M	100Y	5M	90Y	0M
½	78Y	8M	88Y	7M	78Y	5M
1	64Y	12M	75Y	10M	68Y	10M
1½	53Y	17M	65Y	15M	49Y	23M
2	45Y	24M	52Y	20M	41Y	32M
2½	35Y	31M	42Y	28M	32Y	42M
3	24Y	42M	34Y	45M	23Y	56M
3½	17Y	53M	27Y	60M	15Y	75M
4	10Y	69M	17Y	76M	6Y	102M
4½	6Y	89M	10Y	105M	0Y	150M
5	0Y	130M	0Y	170M*	—	—

*Some enlargers in this group have a maximum magenta setting higher or lower than 170M. For these enlargers, set the highest possible magenta value as an approximate equivalent to filter 5.

EXPOSING LIGHT SOURCES

MULTIGRADE papers are designed for use with most enlargers and printers, that is, those fitted with either a tungsten or tungsten halogen light source. They are also suitable for use with cold cathode (cold light) light sources designed for variable contrast papers.

Other cold cathode (cold light) and pulsed-xenon light sources may give a reduced contrast range. Some additional yellow filtration, up to 70Y, may help. The contrast range will depend on the spectral characteristics of the light source used. The only way to determine the contrast range available with each model of enlarger is to carry out a practical test.

DIFFUSER vs. CONDENSER ENLARGERS

MULTIGRADE papers are designed for use with both diffuser and condenser enlargers. However, because of the different types of illumination, there can be a contrast difference between the two types. In practical terms, condenser enlargers give about an extra grade of contrast compared to a diffuser enlarger. This contrast difference depends on the amount of silver left in the negative. Thus there is little change of contrast between the enlarger types for flat negatives and also for the dye image of ILFORD XP2 SUPER negatives.

PROCESSING

B&W RC PAPERS

PROCESSING AND FINISHING ILFORD RESIN COATED PAPERS

ILFORD resin coated papers are processed in a similar way to other resin coated papers. All ILFORD resin coated papers can be tray or machine processed.

TRAY PROCESSING

AGITATION

Use intermittent agitation when tray processing prints, that is, intermittently rock the tray when processing single sheets or interleave them when processing several sheets of paper at once.

To interleave prints, slip the sheets face down, one at a time, into the tray. Then pull out the bottom sheet and place it on top of the remaining sheets in the tray. Continue moving the bottom sheet to the top, until the processing step is complete.

NOTE: Photographic chemicals are not hazardous when used correctly. Always follow the health and safety recommendations on the packaging. Material Safety Data Sheets containing full details for the safe handling, disposal and transportation of ILFORD chemicals are available from ILFORD or on the web at ilford.com.

DEVELOPMENT

ILFORD Developer	Dilution	Temperature (°F)	Time (min)
MULTIGRADE	1+9	68	1
MULTIGRADE	1+14	68	1½
PQ UNIVERSAL	1+9	68	1
BROMOPHEN	1+3	68	1½ - 3

To maintain print-to-print consistency when batch processing a large number of prints, it may be advantageous to reduce exposure slightly and extend development.

MULTIGRADE 1+9 and PQ UNIVERSAL 1+9

On correctly exposed prints, the image will begin to appear after 10 - 15 seconds with these developers. The minimum recommended development time for high-quality prints is 45 seconds; after this time there is a more gradual image build-up. Overexposed prints developed for a minimum of 35 seconds are acceptable for those applications where the highest quality is not required.

PROCESSING

B&W RC PAPERS

DEVELOPER CAPACITY

The following table gives the developing capacity for one liter of working strength developer.

ILFORD Developer	Dilution	8x10 inches
Liquids		
MULTIGRADE	1+9	100
MULTIGRADE	1+14	70
PQ UNIVERSAL	1+9	80
Powder		
BROMOPHEN	1+3	70

MULTIGRADE and PQ UNIVERSAL DEVELOPERS

MULTIGRADE and PQ UNIVERSAL Developers are suitable for developing all black and white papers. MULTIGRADE Developer can be used at the standard dilution of 1+9 or at 1+14 for greater development control and for economy.

MULTIGRADE and PQ UNIVERSAL Developers are clean working and have excellent keeping properties. They can be stored as concentrates in full unopened bottles for up to 1½ years; in half-full bottles, they have a shelf life of 6 months. Diluted developer will stay in good condition in the open tray for two working days, at dilution 1+9, and for one working day, at dilution 1+14 (MULTIGRADE Developer).

The darker color of these developers, compared with some other liquid developers, is normal and does not indicate that the developer has deteriorated in any way.

STOP BATH

After development, rinse prints in an acid stop bath, such as ILFORD ILFOSTOP. A stop bath stops development immediately, reduces the risk of staining and will extend the life of the fixer bath.

ILFORD Stop Bath	Dilution	Temperature (°F)	Time (sec)
Liquid			
ILFOSTOP	1+19	68	15

The capacity of ILFOSTOP Stop Bath is approximately 60 8x10 inch prints per liter of working strength solution. Discard ILFOSTOP Stop Bath when the indicator turns from bright orange to purple. Alternatively, discard the solution if the prints still feel slimy after 15 seconds in the bath.

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A water rinse can be used instead of a stop bath, but it must be changed frequently to avoid processing marks.

FIXING

ILFORD Non-hardening Fixer	Dilution	Temperature (°F)	Time (sec)
ILFORD RAPID FIXER	1+4	68	30
HYPAM Fixer	1+4	68	30

The use of a hardening fixer is not recommended as it reduces washing efficiency.

There is no benefit in extending fixing beyond the recommended time; some loss of print quality might be seen when long fixing times are given due to image etching.

FIXER CAPACITY

The capacity of a fixer is limited by the build-up of silver in the bath. A silver level of 4 - 6g/l is safe for all commercial use with resin coated papers. This approximates to 80 8x10 inch prints per liter of working strength fixer. For prints with maximum stability, that is, for long-term storage, a silver level of 1g/l should be used. This approximates to 20 8x10 inch prints per liter of working strength fixer.

TWO-BATH FIXING

Although not normally recommended with resin coated papers, two-bath fixing can be beneficial when toning for aesthetic effect or to protect the print for display.

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WASHING

	Temperature (°F)	Time (sec)
Fresh, running water	Above 40	120

When it is important to obtain a print in the shortest possible time, vigorously wash ILFORD resin coated papers for 30 seconds in running water.

Prolonged immersion in water can cause edge penetration and print curl with resin coated papers. For this reason, avoid wet times longer than 15 minutes.

DRYING

Optimum quality results will be obtained with the ILFORD series of dryers, for example, the ILFOLAB 1250RC. ILFORD dryers will give the best possible finish on all ILFORD paper surfaces and produce a high gloss finish on ILFORD glossy papers.

When a dryer for resin coated papers is not available, remove surplus water from the prints and leave them to dry. At room temperature, prints will dry in 10 - 20 minutes.

NOTE: ILFORD resin coated papers, as with other resin coated papers, should not be glazed or dried on a drum or flatbed glazer, as this can cause the polyethylene in the paper to stick to the glazing surface, damaging the print.

MACHINE PROCESSING

ILFORD resin coated papers can be processed in all conventional machines for black and white resin coated papers.

PROCESSORS

This section is a guide to setting up processors for ILFORD resin coated papers using ILFORD 2000 RT Developer/Replenisher and 2000 RT Fixer/Replenisher. These are diluted 1+4 to make tank or replenisher solutions. These suggestions are only a guide and the processing cycle should be checked in the processor. For further guidance, contact your local ILFORD company or distributor.

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SUGGESTED DEVELOPMENT TIMES

The preferred temperature range is 68° - 86°F.

Temperature (°F)	Development Time (sec)
68	45-50
77	30-35
86	20-25
95	15-20

These times are for replenished systems, with a solution life of up to three months and non-replenished systems with a maximum solution life of seven days. The suggested developer replenishment rate is 150-200ml/m² paper processed.

The solution life is dependent on paper throughput and a suggested minimum is 30ft² or 54 8x10 inch sheets of paper per liter (0.26 gallons) of working strength solution per week. If paper throughput is considerably less than this, to maintain print quality it may be necessary either to make up fresh tank solution every 6 weeks or to double the replenishment rates.

SUGGESTED FIXING TIMES

The same times and temperatures as for development can be used for fixing. The actual fixing time, however, is shorter, and 20 seconds is ample above 68°F. These recommendations are suitable for both replenished and non-replenished systems. In non-replenished systems, the maximum paper throughput is 44ft² or 80 8x10 inch prints per liter of working strength solution. The suggested fixer replenishment rate for replenished systems is 300 - 450ml/m² of paper processed.

NOTE: If fixing is not complete, then adequate washing is impossible.

WASHING TIMES

Wash for at least 15 seconds at temperatures above 40°F. Set the water flow so as to fill the wash tank in 4 minutes or less.

HOT AIR DRYING

Use temperatures up to 85°F.

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RETOUCHING

ILFORD prints can be spotted and air brushed using dye (for a glossy finish) or water color (for a matt finish), in the same way as other resin coated papers.

When knifing resin coated prints, dampen the area to be knifed, then use a sharp, pointed blade to scrape away the emulsion. Alternatively, bleach out specks completely using local chemical reduction. After knifing or local reduction, rewash and dry the print, then spot the resulting white area in the usual way.

BACKWRITING

The back of ILFORD resin coated papers is treated to accept pencil, most ball-point pens, non-water-soluble felt-tipped pens, fast drying stamp pad inks and all printing inks formulated for polyethylene printing.

MOUNTING

ILFORD prints can be mounted in one of the following ways. When prints are to be mounted for long periods (in excess of 1 - 2 years), the dry mounting method is recommended.

DRY MOUNTING

ILFORD prints can be dry mounted in the usual way. The use of a foil overlay is recommended for glossy surfaces and the use of silicone release paper for other surfaces.

Although the manufacturers' recommendations should be followed, most tissues will give good results in a dry mounting press at a temperature of 175°F (80°C) - 195°F (90°C) with prints under pressure for about 30 - 40 seconds.

DOUBLE-SIDED ADHESIVE SHEETS/COLD MOUNTING FILMS

These provide a very effective and convenient means of mounting ILFORD papers onto porous or non-porous surfaces, without the need for special machinery. Some adhesive sheets allow the print to be repositioned after fixing. Several makes are available in sheet or roll form.

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SPRAY ADHESIVES

Spray adhesives are suitable for mounting ILFORD papers.

NOTE: Always read the safety advice given by the manufacturers before using spray adhesives.

CONTACT ADHESIVES

These adhesives are available in liquid form for brushing or spraying and are suitable for mounting ILFORD papers onto porous or non-porous mounts. Solvents must be allowed to evaporate completely from both print and mount before the two are brought into contact.

WET MOUNTING

ILFORD papers can be mounted onto porous surfaces using wet adhesives such as those designed for wall coverings. When mounting large prints, this method is an advantage, as there is time to position the print correctly and remove any air bubbles that might have become trapped between the print and the mount, without damaging the print. Wet mounting resin coated paper on non-porous materials (e.g., metal) is not recommended.

DISPLAY OF PRINTS

Prints made for display must be toned to protect them from oxidizing gases that are found in many environments. These gases come from everyday items such as newly laid carpet, wet gloss paint, newly applied adhesives and car exhaust. Selenium toner is recommended as it has little effect on the image color. Sulfide (or sepia) toning also gives an image increased stability, as do polysulfide toners.

Laminating with a non-permeable laminate may also help, but ideally prints should be toned before laminating.

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PROCESSING

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DEVELOPMENT

The following developers and development times are recommended. In addition, most other good-quality paper developers can be used to develop ILFOBROM GALERIE FB, MULTIGRADE IV FB and MULTIGRADE FB WARMTONE.

ILFORD Recommended Developers

	Dilution	Time Range (min)
Liquid		
PQ UNIVERSAL	1+9	1½ - 3
MULTIGRADE	1+9	1½ - 3
Powder		
BROMOPHEN	1+3	1½ - 3

Processing conditions: 68°F (20°C), intermittent agitation.

On correctly exposed prints, the image will begin to appear after 35 seconds. Development may be extended to 6 minutes without any noticeable change in contrast or fog.

To maintain print-to-print consistency when batch processing a large number of prints, it may be advantageous to reduce exposure slightly and extend development.

For greater development control and added economy, MULTIGRADE Developer can also be diluted at 1+14. Diluted MULTIGRADE Developer will stay in good condition in an open tray for two working days at dilution 1+9, and for one working day at dilution 1+14.

STOP BATH

After development, rinse prints in an acid stop bath. ILFORD ILFOSTOP Stop Bath is recommended, diluted 1+19. The use of a stop bath terminates development immediately and helps to maintain the fixer bath in good condition. When a stop bath is not available, a plain water rinse may be used, provided care is taken to change it completely at regular intervals.

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FIXING

ILFOBROM GALERIE FB, MULTIGRADE IV FB and MULTIGRADE FB WARMTONE prints should be fixed in ILFORD RAPID FIXER (1+4) for 60 seconds at 68°F (20°C). Alternatively, use ILFORD RAPID FIXER (1+9) for 2 minutes at 68°F (20°C).

Two-bath fixing can also be used. Fix prints for half the recommended fixing time in the first bath, then transfer them to the second bath for the remainder of the time. When the capacity of the first bath is reached, discard it and replace it with the second bath.

Make up a fresh second bath. This cycle can be repeated four times. If two bath fixing is not used, then the fixing and washing sequence using ILFORD UNIVERSAL Wash Aid is recommended.

The use of a hardening fixer is not recommended as it impairs the efficiency of the wash. A hardener *CANNOT* be used with ILFORD RAPID FIXER.

CHECKING PAPER FOR ADEQUATE FIX

It is easy to test for residual silver salts in the paper and thus check whether the paper is adequately fixed.

Make up a stock testing solution by dissolving 2g of sodium sulfide in 125ml of water. Dilute this stock solution 1+9 with water for use. Place a drop of the solution on a white area of a print that is known to be well fixed and washed. Blot any excess solution. The barely visible cream tint that remains is the reference color for a well fixed and washed print.

Soak any prints that show a yellowing of the test spot in fresh water for 5 minutes, then repeat the recommended fixing and washing sequence using fresh fixer.

A full, tightly capped bottle of stock testing solution will keep in good condition for three months. Once diluted to make working strength solution, it should be used within a week.

WASHING

Prints should be thoroughly washed in running water for a minimum of 60 minutes, or follow the ILFORD Archival Wash Sequence.

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ILFORD ARCHIVAL PROCESSING SEQUENCE

The recommended processing sequence is as follows:

DEVELOPMENT	PQ UNIVERSAL Paper Developer (1+9)	2 minutes
STOP BATH	ILFOSTOP Stop Bath (1+19)	5-10 seconds
FIXING	ILFORD RAPID FIXER (1+4)	60 seconds
FIRST WASH	Good supply of fresh running water	5 minutes
WASH AID	UNIVERSAL Wash Aid (1+4)	10 minutes
FINAL WASH	Good supply of fresh running water	5 minutes

All processing times are at 68°F (20°C).

This sequence, totalling approximately 23 minutes, is shorter than the over 60 minute sequence detailed in the ANSI method.

PROCESSING

DEVELOPMENT

PQ UNIVERSAL Paper Developer is supplied as a liquid concentrate and is diluted 1+9. The recommended development time is 2 minutes at 68°F (20°C). On correctly exposed prints, the image will begin to appear after about 35 seconds.

With PQ UNIVERSAL Paper Developer, development time may be reduced to 1 minute or extended to 4 or more minutes without any noticeable change in contrast or fog.

STOP BATH

After development, prints should be rinsed in ILFOSTOP Stop Bath, a specially formulated acid stop bath, which is diluted 1+19 for use.

The stop bath terminates development immediately and helps maintain the fixer bath in good condition. The importance of maintaining the fixer at optimum levels will be discussed later.

SPECIAL FIXING SEQUENCE

The fixing step in the ILFORD Archival Processing Sequence is substantially shorter than the traditional method. Because this step is so vital to the making of permanent images, a detailed explanation of the concept follows.

The major cause of image instability is residual thiosulfate complexes and their decomposition products. These substances originate in the fixing bath and attach themselves to the fibers of the paper base.

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The key to understanding the ILFORD Archival Processing Sequence is the recognition that the rate of fixing of the silver image is substantially faster than the rate of build-up of thiosulfate complexes in the fibers of the paper.

In actuality, the thiosulfate complexes that can ultimately damage the print build up at a rather slow rate. The longer the fix, the greater time these have to penetrate the paper.

The ideal fix, then, is one that provides for complete fixing of the silver image in the shortest possible time... to minimize the time thiosulfate complexes have to build up.

The ILFORD Archival Processing Sequence is based on this fact. It uses ILFORD RAPID FIXER diluted 1+4 for just 60 seconds.

After fixing, thiosulfate levels are lower than those achieved with the ANSI sequence (ANSI PH 4.32 - 1974). And, as a result, wash time can be significantly shortened.

In practical terms, the fixing and washing sequence specified in the ILFORD Archival Processing Sequence takes just over 20 minutes and gives residual thiosulfate levels about one-quarter of those achieved with 5 - 10 minutes fixing followed by normal washing in running water for 60 minutes. This sequence leaves residual thiosulfate levels equal to or lower than those achieved with the ANSI processing method.

When using ILFORD RAPID FIXER, thorough fixing is achieved in 60 seconds at 68°F (20°C) provided that 1) the fixer capacity has not been exceeded, 2) reasonable agitation has been given and 3) too many prints are not being fixed at the same time.

The level of residual thiosulfate present in the paper after this sequence is, on average, 0.2 micrograms/cm². This extremely low level is detectable only by relatively sophisticated analytical techniques such as the ANSI Methylene Blue Method for Measuring Thiosulfate (PH 4.8 - 1971).

Less sensitive tests such as the Thiodet type and other residual hypo test solutions (e.g., the HT-2 Residual Hypo Test Solution recommended by Kodak) are unable to detect these small quantities of thiosulfate.

FIXER SOLUTION CAPACITY

The recommended capacity of ILFORD RAPID FIXER for ILFOBROM GALERIE FB, MULTIGRADE IV FB and MULTIGRADE FB WARM TONE is about 40 sheets of 8 x 10 inch paper, or equivalent, per liter of

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working strength solution when using a two-bath fix system. When a regular wash is used, capacity for single-bath fix is 10 sheets of 8x10 inch paper per liter. By using the ILFORD Archival Processing Sequence, the capacity of a single-bath fix increases to 40 sheets of 8x10 inch paper per liter.

When in doubt about the number of prints that have been fixed in a particular bath, it is an easy matter to determine the silver concentration with the aid of estimator papers (i.e., Kodak Silver Estimating Test Papers). When using the ILFORD Archival Processing Sequence, a maximum of 2 grams of silver per liter is recommended. With normal washing, do not exceed 0.5 grams of silver per liter.

UNIVERSAL WASH AID

UNIVERSAL Wash Aid is specifically formulated to aid the efficient removal of the by-products of fixing. As a result, sufficient washing can be achieved while overall wash time can be substantially reduced. UNIVERSAL Wash Aid is supplied as a liquid concentrate and is diluted 1+4 with water to make a working strength solution. UNIVERSAL Wash Aid has a capacity for 40 sheets of 8x10 inch paper, or equivalent, per liter of working strength solution.

CONTRAST MODIFICATIONS

Occasionally, an expert printer may want a paper contrast that is slightly different from the contrast grade built into the paper. Or the printer may wish to modify the contrast in selected areas of the print. This can be accomplished during processing.

Three options exist for contrast modification during processing:

1) developer choice, 2) local use of water and/or concentrated or hot developer, 3) bleaching to open up areas. Details on the last option appear in the section that follows.

BLEACHING

Overall bleaching is sometimes required to brighten the highlights of prints. The following formula may be used successfully.

Solution A

Potassium ferricyanide	100g
Water to make	1000ml

Solution B

Sodium thiosulfate (hypo crystals)	200g
Water to make	1000ml

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For use, add to Solution B only enough Solution A to color the mixture pale yellow (i.e., about 10ml of A to 200ml of B). Too high a concentration should be avoided because it makes the process of bleaching very difficult to control. The mixed solution does not keep and should be used immediately.

When the required density has been reached, the print should be rinsed and then transferred to a fresh fixing bath. This will stop the bleaching and also clear the yellow stain. For maximum permanence, the ILFORD Archival Washing Sequence should then be repeated.

If bleaching is done "in line," a separate tray of fix should be used to prevent the ferricyanide from contaminating the working fix.

With practice, very fine control of density may be achieved by applying the bleach to the desired area with a brush or small pad of cotton. This can be done with either wet or dry prints.

When working with a wet print, it should first be removed from the wash, placed on a clean, dry surface and then squeegeed thoroughly to remove surface moisture. The remaining part of the procedure is the same for both wet and dry prints. The bleach can then be carefully applied to the desired area and the action stopped by brushing the same area with fresh fix.

After the work is complete, the print should be thoroughly washed, preferably repeating the ILFORD Archival Washing Sequence.

One disadvantage of bleaching (slightly more apparent when working with wet prints) is that the bleach is apt to spread, leaving a light halo effect around the areas being worked. Using a brush overloaded with bleach will aggravate the problem. This area must then be spotted to match the surrounding areas.

DRYING

There are three traditional ways to dry fiber base enlarging papers: air drying, blotting or heat drying. (Photographic blotters and belt print dryers are not recommended with MULTIGRADE FB WARMTONE as there is a risk that prints will stick to them.)

AIR DRYING

After taking prints from the wash, they should be placed face up on a clean surface, allowed to drain and then squeegeed on both sides to remove excess water. They can then be hung on a line with clips or placed face down (face up for MULTIGRADE FB WARMTONE) on a clean nylon or plastic mesh screen to dry.

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Air drying does have one disadvantage, however. Prints tend to curl while drying and can be difficult to flatten effectively.

PHOTOGRAPHIC BLOTTERS

The use of photographic blotters is widespread since they assist in producing neat, flat prints that are easy to work with for mounting or storage.

It is essential that only photographic-quality blotters be used; others invariably contain contaminants that can have an adverse effect on the archival quality of the resultant prints. Photographic blotters are generally available in most photographic stores.

The following procedure has been found to work well:

1. Squeegee the print and place it on a clean blotter.
2. Place a blotter on top of the print and rub the blotter lightly.
3. Squeegee a second print and place it on the second blotter and rub lightly. Continue in this way until all the prints have been placed between blotters.
4. Turn the stack of prints and blotters over and place the top print on three clean blotters. Cover that print with three clean blotters and transfer the second print from the first stack to this new stack. Continue in this way until all the prints have been transferred to the second stack.
5. When all the prints have been placed between sets of three sheets of blotters, place a weight on top of the stack to flatten the prints and leave the prints for about half an hour.

HEAT DRYING

There are two problems associated with heat drying on flatbed and rotary dryers. The first is of a general nature and concerns prints sticking to the blanket. The second relates to the requirement that the blanket must be perfectly clean to ensure maximum permanence for prints.

The first problem is alleviated by the addition of hardener to the fixer (ILFORD RAPID FIXER is not compatible with hardeners). This is not recommended for prints requiring a high degree of permanence. However, it is highly recommended that UNIVERSAL Wash Aid be used, for it is formulated with a special ingredient to minimize sticking without the addition of hardener.

The second problem is associated with the difficulty of keeping the dryer blanket or apron absolutely clean. Great care must be taken to ensure that only those prints that have been thoroughly washed are

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dried on such equipment, otherwise the blanket can easily become contaminated with fixer. Remember, it takes only one insufficiently washed print to contaminate all others that are dried subsequently.

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RETOUCHING

SPOTTING

This is the name given to the correction of small, light-toned or white defects on prints caused by opaque defects in the negative or, more commonly, by dust particles on the negative carrier glass or negative itself.

In the past, it was a fairly common practice to use ordinary India ink for spotting. More recently, modern photo-dyes such as Spotone have become almost universal because they are considerably easier to work with. They can be readily blended to achieve the desired match. Spotone is manufactured by Retouch Methods Company and is generally available in photographic stores.

When older, water-based dyes are used, working with glossy material may result in the spotted areas appearing dull compared with the surrounding print. This can be effectively overcome by mixing the dye with a little gum arabic or Lepage's arabic gum. The mixture imparts a gloss that, with practice, will closely match that of the unferrotyped glossy surface.

As a first requirement, it is essential that a good brush with a fine well-pointed tip be used. The actual size of this brush is not so important as the tip. Often a large brush, size 1 to 3, will be found more useful than a 0 or 00.

The golden rule is to apply the color in very small amounts and to build up the density gradually using a stippling action rather than attempting to do too much at a time. Before actually applying the color to the print, it should be carefully blended to match the required image color, then tested on some white paper or blotting paper to check for density and color. It is much easier to work with a fairly dry brush, since using a brush too wet will inevitably cause the color to spread outwards, resulting in a halo of increased density around the spotted area.

If the print has been handled prior to spotting, it is likely that the surface will have picked up some grease from the fingers, which will often prevent the dye from taking properly. Wiping the print carefully with a soft, clean, dry cloth will usually overcome this, but in extreme cases, a mild solvent may be used. The addition of a little wetting agent to the spotting dye also helps.

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Where very faint or fine lines are involved, many technicians find it easier to apply a soft pencil lightly to the affected area, rubbing gently with a cloth or tissue afterwards to blend it in. It is vital that this be done very lightly, since any undue pressure by the pencil will leave a permanent mark in the emulsion layer of the print.

ETCHING

Dark spots or streaks may be physically removed by carefully scraping away the emulsion of the print. This technique requires both patience and practice before consistently successful results can be achieved.

A very sharp blade with a rounded point is required. The blade should be held perpendicular to the print and the surface should be scraped very lightly.

A disadvantage of etching is that it inevitably leaves marks on the print surface that will show up, particularly on glossy prints when they are viewed at varying angles to the light. This effect can sometimes be reduced by resoaking and redrying the print to help reduce the roughening effect. Alternatively, a glossy lacquer may be applied with a brush to the etched area.

MOUNTING

Prints on ILFOBROM GALERIE FB, MULTIGRADE IV FB and MULTIGRADE FB WARM TONE can be mounted successfully using either dry mounting or wet mounting techniques.

DRY MOUNTING

This technique is convenient, fast and clean. It provides a permanent bond between print and mount. The procedure itself is straightforward, but there are certain points to be conscious of when using this method.

It is essential that both print and mounting board be dry. This can be easily ensured by placing both print and board in the mounting press for a few seconds prior to tacking on the tissue and mounting.

The choice of dry mounting tissue is important when mounted prints are required for archival use. The dry mounting tissue should be of neutral pH and the process should ideally be reversible (i.e. it should be possible to remove the print from the mount at a later date without damaging the print in any way).

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The best assurance that mounting tissue is of acceptable quality is to use a product certified by its manufacturer to meet ANSI Standard PH 4.20 - 1958.

It is very important that the board selected be 'acid-free' and 100% rag. The best assurance that the mounting board is of acceptable quality is that it be certified by its manufacturer to meet ANSI Standard PH 4.20 - 1958.

Cleanliness of the work area and meticulous handling techniques are also essential. Even the tiniest particle of dust or dirt trapped between print and mounting board will be seen as an unsightly and permanent lump on the print. Board, tissue and print should always be carefully cleaned before mounting.

One final point. Prints should not be subjected to heat in the press for longer than necessary or at a higher temperature than recommended by the tissue manufacturer. 20 seconds should normally suffice at temperatures between 175°F (80°C) and 195°F (90°C). Excessive time and/or higher temperatures will cause the print to undergo a mild form of accelerated aging.

WET MOUNTING

Wet mounting is generally used to mount very large prints for display purposes and is not recommended where the highest level of image permanence is required. Conservationists are unanimous in their condemnation of this method because it is assumed that the vast majority of adhesives (with the possible exception of flour paste or rice starch) will have long-term destructive chemical action on the paper fibers.

Therefore, this technique can be recommended only when long-term storage or display is not an important consideration.

STORAGE & CONSERVATION

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STORAGE AND CONSERVATION OF PRINTS

Much debate has surrounded this subject in recent years. Understandably, not all workers in this field agree on the relative importance of all the factors involved, but there are a number of well understood and proven guidelines that can be stated with a fair degree of confidence. (ANSI Standards PH 1.48 - 1974 and PH 4.20 - 1958 should be consulted for a comprehensive discussion of print storage and conservation.)

For true archival permanence, material should be stored under precise conditions of controlled humidity and temperature with minimum daily cycling within prescribed limits. Storage should be in total darkness at 30 - 50% humidity. Temperatures should be maintained between 68°F and 77°F (20°C - 25°C). Daily cycling greater than 7°F (4°C) should be avoided. When materials have to be viewed, tungsten illumination should be used. Daylight or fluorescent light tubes should never be used because they are too rich in ultraviolet radiation.

Repeated handling deteriorates photographs. Most galleries and archives that permit viewing original prints insist that white gloves be worn.

Envelopes and containers used for print storage must be constructed of suitable materials. Cabinets made of newly varnished or bleached wood, composition board, hardboard, etc., should all be avoided because the resins and glues used in their construction release gases that, over the years, will have a harmful effect on the images. Baked-enamel metal boxes and filing cabinets are probably the safest of all and have the added advantage of offering some degree of fire protection.

Individual boxes, envelopes and sleeves for prints should also be chosen with great care and should be specifically recommended for this type of use. Plastic sleeves are made of PVC. As a result of the plasticizers used in PVC formulation, these sleeves can release chlorine and other harmful gases that will be detrimental to print life. An inert polyester such as Mylar or Estar is much more suitable. In any case, one should only use products that the manufacturer certifies as meeting ANSI Standard PH 4.20 - 1958.

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TONING

There are two basic reasons for toning prints:

1. *To provide additional protection for the image.* Toners convert or coat the silver image, giving it greater resistance to damage by atmospheric or other external contaminants. Hence, a toned print is generally "more archival."
2. *For aesthetic effect and creating mood.* For many years, photographers have used toners to improve the appearance of their prints and as an aid in creating a certain atmosphere that they may wish to convey. For example, subjects such as snow scenes, seascapes and night views are often enhanced by the use of blue toners. Subjects like portraits, sunlit landscapes and sunsets often benefit from warm brownish or even reddish toning.

Research has clearly indicated that selenium toning offers very good protection from external contaminants. Sulfide (sepia) toning offers slightly less image protection. Gold toning, using various formulae including Kodak GP1 and GP2, slightly increases the resistance to attack by external contaminants.

Tests have also been carried out with some of the more modern color toner kits for black and white papers. Although these do work and may be of interest for their creative effects, those tested were found to have an adverse effect on the long-term keeping properties of the image.

CAUTION: Be aware that many of the substances contained in the following formulae, if not used properly, can be hazardous to your health. **KEEP OUT OF REACH OF CHILDREN.** Before using any chemicals, you should read the manufacturer's label and Material Safety Data Sheets and use appropriate precautions. All chemicals should be disposed of in accordance with applicable federal, state and local environmental regulations.

SELENIUM TONER

Owing to the difficulty and possible hazards involved in preparing this toner from individual chemicals (selenium compounds are extremely toxic substances), it is recommended that a proprietary brand be used such as Kodak Rapid Selenium Toner. This is diluted 1+3 or 1+9 for use.

ILFOBROM GALERIE FB, MULTIGRADE IV FB and MULTIGRADE FB WARMTONE prints may be toned after completion of the Archival Wash Sequence or may be resoaked in water for 2 minutes prior to toning. Maximum protective effect is achieved in about 4 minutes of

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toning with a 1+3 diluted toner (8 minutes with a 1+9 diluted toner). The process is completed by repeating the ILFORD Archival Washing Sequence using UNIVERSAL Wash Aid solution kept only for this purpose.

To tone ILFOBROM GALERIE FB, MULTIGRADE IV FB and MULTIGRADE FB WARMTONE paper during Archival Processing, use the following sequence:

Fixing	ILFORD RAPID FIXER (1+4)	1 minute
Toner	Kodak Rapid Selenium toner diluted 1+20 with ILFORD UNIVERSAL Wash Aid (1+4)	5 minutes
Washing aid	ILFORD UNIVERSAL Wash Aid (1+4)	10 minutes
Final wash	Good supply of fresh, running water	30 minutes

In general, there is a small increase in print density with selenium toning. As such, toning can make the blacks even deeper. To compensate if increased print density is not desired, it is recommended that prints made for selenium toning be printed slightly lighter than normal. Selenium toning will not appreciably change the image color of ILFOBROM GALERIE FB and MULTIGRADE IV FB prints, but it will noticeably change the image color of MULTIGRADE FB WARMTONE.

SULFIDE TONER (SEPIA TONER)

This is a two-stage process using separate bleach and toning solutions.

1. Fix and wash the prints as recommended in the special processing sequence. Re-soak for 2 minutes if prints have been dried.
2. Bleach the prints for between 1 and 3 minutes, depending on the number of prints that have been through the bath.

Bleaching Solution

Water	500ml
Potassium ferricyanide	50g
Potassium bromide	50g
Water to make	1000ml

3. Wash for up to 10 minutes to remove the yellow bleach stain.
4. Immerse the bleached and washed prints in the sulfide toner.

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Sulfide Toner

Sodium sulfide	50g
Water to make	1000ml

For use, dilute 1+9.

Toning is usually complete in about 5 minutes and the process is completed by repeating the ILFORD Archival Washing Sequence using UNIVERSAL Wash Aid solution kept only for this purpose.

Similar results will be achieved with thiourea carbonate toner, which has the additional advantage of being odorless.

Thiourea Carbonate Toner

Thiourea	2g
Sodium carbonate (anhydrous)	100g
Water to make	1000ml

Use at working strength.

Toning is usually complete in about 2 - 4 minutes and the process is completed by repeating the ILFORD Archival Washing Sequence using UNIVERSAL Wash Aid solution kept only for this purpose.

Toning prints creates an aesthetic effect and, in some cases, can help to protect the print from external contaminants. MULTIGRADE RC WARMTONE, in particular, is receptive to a wide range of toners and can be toned to give subtle color changes or dramatic effects. Especially recommended are polysulfide toners, such as Kodak Brown Toner or Agfa Viradon, and selenium toners. Other toners can be used to create different effects. Use the instructions supplied with the toner.

Printing and Processing Pointers for Better Toning

EXPOSURE

Some toners intensify (blue, selenium, etc.) while others reduce the density (sulfide toners [direct and indirect] and most dye toners). It is often necessary to adjust print densities to compensate for these effects. When using a variable warmth sepia toner formulated to give a very warm image tone, the density and contrast loss can be considerable. Prints intended for brown/sepia toning should be made slightly darker and higher in contrast. Selenium toning increases contrast slightly and deepens shadows so underexposing prints which will be selenium toned may be desirable.

DEVELOPMENT

It is most important that prints are always fully developed. In fact, with brown/sepia toning, overdeveloping by about 50% is a good way to obtain the slight extra density required.

B&W TONING

POINTERS

STOP BATH

This is essential to prevent uneven development which is often much more apparent after toning.

FIXING

This should be thorough to prevent staining. One- or two-bath fixing can be used and hardening fixers are not recommended. Hardeners will impede not only fixing and washing but toning as well.

WASHING

This should also be thorough as many toners react with residual thiosulfate to produce staining and/or bleaching. Exceptions are hypo-alum toner and Kodak T21 Gold toner which can be used with a short wash after fixing. ILFORD MULTIGRADE FB WARMTONE paper incorporates optical brighteners that CAN be washed out, but MULTIGRADE WARMTONE RC does not. This means that the longer you wash the fiber paper the warmer the base will appear.

SULFIDING OR DARKENING SOLUTIONS

The solutions normally used in bleach and re-develop sepia toning are either a 1-2% solution of sodium sulfide or an alkaline solution of thiourea. Both of these need very careful handling. Thiourea is a powerful fogging agent and great care should be taken to avoid any contamination. Sulfide solutions give off hydrogen sulfide gas, which has a very offensive odor. High concentrations of the gas may be toxic and can also act as a fogging agent. (See CAUTION.)

WASHING AFTER TONING

Some toners contain thiosulfate (Kodak Rapid Selenium, Polytoner and hypo-alum) and need a full wash after toning. With fiber papers, the use of a wash aid is advisable. Some other toners (blue being the most common) produce images which are slightly soluble in alkaline tap water so wash times should be kept as short as possible.

DRYING

Heat drying should be avoided with toned prints as there is often a loss of color.

CAUTION:

Before using any chemicals, you should read the manufacturer's instructions and Material Safety Data Sheets and use appropriate precautions. All chemicals should be disposed of in accordance with federal, state and local environmental regulations. Keep ALL chemicals out of the reach of children.

B&W TONING

THE FOUR CATEGORIES

DIRECT SULFIDE TONERS

These are single solution toners which act on the image directly to convert it, partially or completely, to silver sulfide.

Commercial toners such as Agfa Viradon or Kodak Brown toner are both alkaline solutions of polysulfides and fit into this category. Hypo-alum toners work in a similar way but are not widely available commercially prepared. These toners can be used at room temperature but they act very slowly, taking up to 30 minutes to reach completion. This time can be shortened considerably by raising the temperature to 100°F. Unfortunately, the foul smelling toning solution is even more unpleasant at higher temperatures. Direct sulfide toners work well with MULTIGRADE FB WARM TONE paper. These toners have the advantage that toning can be stopped when the desired color is reached. Partially toned prints can also be further treated in other toners to produce various other special effects. The colors you can achieve with these toners range from light brown to dark brown.

B&W TONING

THE FOUR CATEGORIES

INDIRECT SULFIDE TONERS

Indirect sulfide toners use a two-step bleach and re-develop process to convert the silver image, either partially or completely to brown silver sulfide. Nearly all the so-called "sepia toners" on the market fall into this category.

The bleach is usually a ferricyanide bromide type which converts the silver image to silver bromide. The darkening (re-developing) bath used is usually a solution of sodium sulfide. Kodak sepia toner uses this type of re-developer. However, this solution has a very strong smell and most people now prefer to use the odorless toners. These use an alkaline solution of thiourea to convert the silver bromide image to silver sulfide. Apart from being odorless (a real plus!) they also have the advantage of allowing the resulting image color to be adjusted by controlling the pH of the second bath. The pH adjustment is achieved by adding more or less sodium hydroxide solution to the second bath. More additive gives a colder image tone, less additive gives a warmer image tone. These so-called variable warmth toners work well with all the ILFORD papers but a larger addition of the hydroxide solution is required with MULTIGRADE WARMTONE papers to stop the image tone from becoming too yellow.

The sulfide sepia toners and non-variable warmth thiourea toners work well with ILFORD MULTIGRADE WARMTONE papers. The colors you can achieve with these toners range from yellow brown to rich chocolate brown.

Prints toned in sepia toner can be further toned in blue (iron) toner to give a green tone or, if only partially bleached, a blue/green/sepia split tone. They can also be treated in a gold toner to produce an orange-red image.

B&W TONING

THE FOUR CATEGORIES

SELENIUM & GOLD TONERS

Selenium toners are single solution toners that partially convert the original silver image to silver selenide. The degree of toning can be varied by changing the toning time or solution dilution.

MULTIGRADE WARMTONE papers are very responsive. Treatment at higher dilutions (1+10, 1+20, etc.) gives a slight cooling of the image tone and shift in hue towards red. Used at lower dilutions (1+3, 1+5, etc.) a purplish brown can be achieved.

Most commercial gold toners are single solution toners which, when used on their own, shift the image color of a print to a blue black. However, they are often used in combination with a sepia toner to produce an attractive orange-red color.

B&W TONING

THE FOUR CATEGORIES

METAL TONERS

These toners, usually single solution, convert the original silver image to the ferrocyanide salt of a transition metal.

A number of metals can be used but only those based on iron (blue) and copper (red) are commercially available. These toners can produce very vivid colors and work well with virtually all types of photographic paper. When using a blue toner, it is recommended that the highlights be cleared in a 10% sodium chloride solution.

B&W TONING

RELATIVE TONING RESULTS

TONER	DILUTION
Fotospeed Sepia ST20	Standard + 30ml Additive Standard + 75ml Additive Standard + 100ml Additive Standard + 75ml Additive followed by Tetenal Gold Toner
Kodak Sepia Toner	Standard
Agfa Viradon	1+50 1+50 1+50
Berg Brown/Copper Toner	Standard Standard Standard
Kodak Rapid Selenium Toner	1+9 1+5 1+3
Fotospeed Blue Toner BT20	Standard

IMMERSION TIME	COLOR
Standard Standard Standard	Yellow Brown Slight Yellow Brown Warm Brown
Standard	Reddish Brown
5 min. /3 min.	Yellow Brown
3 min. 5 min. 10 min.	Cold Brown Medium Warm Brown Chocolate Brown
30 seconds 60 seconds 120 seconds	Warm Brown Reddish Brown Brownish Red
5 min. 5 min. 10 min.	Cool Neutral Purplish Neutral Reddish Brown
5 min.	Deep Blue

BLACK & WHITE PAPER CHEMICALS

BROMOPHEN DEVELOPER

BROMOPHEN Developer is a premium-quality powder developer that produces superb results with all types of paper. It produces clean, sharp prints and should be used when the utmost quality is desired. BROMOPHEN allows for long development without fogging and is also economical to use.

MULTIGRADE DEVELOPER

MULTIGRADE Developer is an economical developer in liquid concentrate form, primarily recommended for MULTIGRADE papers. This highly versatile developer can be used to process both resin coated and fiber base papers. MULTIGRADE Developer delivers rich blacks, brilliant whites and a long tonal scale. It is also easy to use and has a long tray life.

PQ UNIVERSAL PAPER DEVELOPER††

PQ UNIVERSAL Paper Developer is a specially formulated wide-latitude developer that works equally well with fiber base and resin coated papers. This long-lasting liquid concentrate allows development up to 4 minutes without fogging.

NEW ILFORD RAPID FIXER

ILFORD RAPID FIXER is a rapid-acting, non-hardening ammonium thiosulfate fixer that ensures complete fixing of all ILFORD papers in as little as 60 seconds. It is **not** compatible with hardeners.

NEW HYPAM FIXER

HYPAM Fixer is an economical, liquid, non-hardening rapid fixer for film and paper processing. HYPAM Fixer is fully compatible with hardeners.

ILFOSTOP STOP BATH

ILFOSTOP Stop Bath is an economical, exhaustion-indicating stop bath used for fiber base or resin coated papers or films.

NOTE: UNIVERSAL RAPID and MULTIGRADE Fixers are discontinued.

†† Product name change only.

BLACK & WHITE PAPER CHEMICALS

UNIVERSAL WASH AID

UNIVERSAL Wash Aid is especially useful for the preparation of exhibition-quality prints on all black and white fiber base papers, particularly prints on MULTIGRADE IV FB, MULTIGRADE FB WARMTONE and ILFOBROM GALERIE FB.

ILFORD 2000 RT CHEMICALS

ILFORD 2000 RT Developer and Fixer are formulated for processing black and white RC papers in roller transport processors such as the ILFORD 2650 RC and ILFORD 2240 RC. These chemicals offer a very long in-tank life and excellent consistency from print to print. ILFORD 2000 RT Fixer **not** compatible with hardeners.

ILFORD 2150 XL CHEMICALS

2150 XL Developer and Fixer are formulated for processing all resin coated papers in the ILFORD ILFOLAB 2150 RC paper processor. These liquid concentrate chemicals offer high capacity with a life of up to 2 weeks or 1000 8x10 inch prints.

PAPER CHEMICAL CAPACITIES

MULTIGRADE DEVELOPER

One liter of working strength developer diluted 1+9 will process up to 50 8x10 inch fiber base prints and 100 resin coated prints.

PQ UNIVERSAL PAPER DEVELOPER††

One liter of working strength developer diluted 1+9 will process up to 45 8x10 inch fiber base prints and 70-80 resin coated prints.

BROMOPHEN DEVELOPER

One liter of BROMOPHEN paper developer diluted 1+3 will process about 40 8x10 inch fiber base prints and 70-80 8x10 inch resin coated prints.

NEW ILFORD RAPID AND HYPAM FIXERS

Fixer capacity varies depending on life expectancy (LE) requirements. Listed below are the recommended numbers of 8x10 inch prints that may be processed in 1 liter of working strength fixer.

Paper	Commercial (LE<25 Yrs.)	Archival (LE>100 Yrs.)
Resin coated	80	40*
Fiber base	40	10
Fiber base (ILFORD Archival Sequence)	—	40†

* Information based on accelerated aging tests and does not reflect real time testing.

† Print capacity increases when following the ILFORD Archival Processing Sequence using UNIVERSAL Wash Aid.

ILFOSTOP STOP BATH

Discard ILFOSTOP Stop Bath when the indicator turns from bright orange to purple. Alternatively, discard the solution if the prints still feel slippery after 15 seconds in the bath.

UNIVERSAL WASH AID

One liter of working strength wash aid will process 40 8x10 inch prints.

†† Product name change only.

ILFORD

GALERIE

PROFESSIONAL INKJET PHOTO RANGE

The ILFORD GALERIE Professional Inkjet range is designed specifically to meet the demanding needs of today's professional photographers and digital artists. ILFORD is dedicated to developing products that deliver superior images. With GALERIE, ILFORD combines state-of-the-art inkjet technology with more than a century of experience in the craft of image making.

To provide the right tools for a variety of applications, ILFORD offers GALERIE in two distinct versions - CLASSIC and SMOOTH.

The GALERIE Classic range is designed to be compatible with photo quality dye-based inkjet printers including Epson, Hewlett Packard, Canon, and Lexmark printers. See instruction sheet inside each box for optimum performance.

The GALERIE Smooth range is designed to be compatible with photo quality dye and pigment-based printers including Epson, Hewlett Packard, Canon, and Lexmark printers. See instruction sheet inside each box for optimum performance.

GALERIE CLASSIC GLOSS PAPER

The true gloss surface of a traditional color photograph has always been the most popular print finish. Now this established favorite has been replicated in the latest edition to the ILFORD GALERIE professional inkjet range of desktop media. Classic Gloss Paper is coated on a traditional RC base and has been developed to meet the demands of the latest dye-based photo quality printers in the marketplace. With the ability to showcase bold color as well as subtle tones, the Classic Gloss surface exhibits the look and feel of a traditional photograph and offers excellent image stability††.

Classic Gloss Paper offers true photographic quality and consistency and, depending on the dye ink* used, a Classic Gloss print displayed unprotected** will last 19 years***. A protected† Classic Gloss print will last 27 years***.

GALERIE CLASSIC PEARL PAPER

There is something about a pearl surface print that makes it stand head and shoulders above the other typical surfaces out in the marketplace and the new ILFORD GALERIE Classic Pearl Paper is no exception. Designed specifically to meet the demands of all the latest high speed dye-based inkjet printers††, Classic Pearl Paper gives superb photographic quality and consistency with no compromises. With the ability to showcase bold color as well as subtle tones, the Classic Pearl surface exhibits the look and feel of a true photograph and offers excellent image stability. The pearl finish of this inkjet media also prevents glare and fingerprint marks.

ILFORD

GALERIE

PROFESSIONAL INKJET PHOTO RANGE

In addition, GALERIE Classic Pearl also lasts like a true photo print and depending on the dye* ink used, a Classic Pearl print displayed unprotected** will last 22 years***. A protected† Classic Pearl print will last 25 years***.

GALERIE SMOOTH GLOSS PAPER

Instant dry is now a 'must have' requirement for all professional users of inkjet media and coupled with a superb heavyweight base, GALERIE Smooth Gloss Paper will not be a disappointment. The instant dry properties are the result of cutting edge microceramic inkjet design. The 280g/m² product is noticeably thicker providing a premium appearance. Smooth Gloss Paper offers superb image quality and consistency and has excellent compatibility with photo quality dye and pigment-based inkjet printers.††

GALERIE SMOOTH PEARL PAPER

GALERIE Smooth Pearl Paper combines the excellent instant dry properties of a microceramic product with the elegant finish of a pearl print. The 280g/m² heavyweight inkjet product is noticeably thicker providing a premium appearance. Smooth Pearl Paper has been designed to be compatible with photo quality dye and pigment-based inkjet printers†† producing prints with excellent consistency and superb photographic quality. The pearl surface eliminates glare and fingerprints giving the true look and feel of a photographic print.

The microceramic technology used in the coating of the Smooth Gloss and Smooth Pearl Papers creates the instant dry effect. As with all microceramic coated media, a certain amount of fading can be seen after a relatively short period of time. ILFORD GALERIE Smooth Gloss and Smooth Pearl Papers are comparable with the other leading microceramic products on the market. However, to ensure image stability it is advisable to frame the image behind glass. Under these storage conditions† your dye-based print will last up to 10 years, depending on the ink used*. Initial accelerated testing indicates that a GALERIE Smooth Paper print, protected or unprotected** will last in excess of 40 years*** when using a pigment ink* desktop printer.

* Image stability is highly dependent on the ink in your printer. Please check printer manufacturer's information for specific performance details.

** Unprotected display indoors away from direct sunlight.

***Image stability figures are based on independent accelerated testing of prints to industry standards by Wilhelm Imaging Research. Actual print life will vary according to the nature of the image and the display conditions (light intensity, temperature and humidity). ILFORD does not guarantee the longevity of prints. At the time of publication of this document, tests of Smooth Papers were in progress at Wilhelm Imaging Research and had already exceeded 40 years.

† Protected print either laminated or under glass, indoors and away from direct sunlight.

†† Please refer to the product instruction sheet or the ILFORD website

GALERIE SMOOTH MULTI-USE PAPER

A true double-sided paper with a smooth matte finish. GALERIE Smooth Multi-Use Paper is ideal for two sided brochures and flyers. Smooth Multi-Use Paper, designed to be compatible with all the latest photo quality dye and pigment based printers, is excellent for printing proofs of photographs, layouts and designs. Superb as an all purpose printing paper, the 140 g/m² product delivers sharp text and crisp graphics.

SPECIFICATION**CLASSIC GLOSS PAPER**

Opacity	99%	Caliper	230 micron
Tint (lab)	95.5, 0.5, -4.0	Gloss	50-80% (20°)

CLASSIC PEARL PAPER

Opacity	99%	Caliper	250 micron
Tint (lab)	94.5, 1.0, -4.7	Gloss	14-22% (60°)

SMOOTH GLOSS PAPER

Opacity	99%	Caliper	275 micron
Tint (lab)	94.5, 1.0, -4.7	Gloss	22-28% (20°)

SMOOTH PEARL PAPER

Opacity	99%	Caliper	280 micron
Tint (lab)	94.5, 1.0, -4.7	Gloss	14-22% (60°)

SMOOTH MULTI-USE PAPER

Opacity	>90%	Caliper	190 micron
Weight	140 g/m ²	Whiteness	103.0

AVAILABILITY

Description	Quantity	Size	Weight
CLASSIC GLOSS PAPER			
Classic Gloss Paper IGCGP9	25	8.5"x11"	240g/m ²
Classic Gloss Paper IGCGP9	100	8.5"x11"	240g/m ²
Classic Gloss Paper IGCGP9	250	8.5"x11"	240g/m ²
Classic Gloss Paper IGCGP9	25	11"x17"	240g/m ²
Classic Gloss Paper IGCGP9	25	13"x19"	240g/m ²
CLASSIC PEARL PAPER			
Classic Pearl Paper IGCPP9	25	8.5"x11"	250g/m ²
Classic Pearl Paper IGCPP9	100	8.5"x11"	250g/m ²
Classic Pearl Paper IGCPP9	250	8.5"x11"	250g/m ²
Classic Pearl Paper IGCPP9	25	11"x17"	250g/m ²
Classic Pearl Paper IGCPP9	25	13"x19"	250g/m ²
SMOOTH GLOSS PAPER			
Smooth Gloss Paper IGSGP9	25	8.5"x11"	280g/m ²
Smooth Gloss Paper IGSGP9	100	8.5"x11"	280g/m ²
Smooth Gloss Paper IGSGP9	250	8.5"x11"	280g/m ²
Smooth Gloss Paper IGSGP9	25	11"x17"	280g/m ²
Smooth Gloss Paper IGSGP9	25	13"x19"	280g/m ²
SMOOTH PEARL PAPER			
Smooth Pearl Paper IGSP9	25	8.5"x11"	280g/m ²
Smooth Pearl Paper IGSP9	100	8.5"x11"	280g/m ²
Smooth Pearl Paper IGSP9	250	8.5"x11"	280g/m ²
Smooth Pearl Paper IGSP9	25	11"x17"	280g/m ²
Smooth Pearl Paper IGSP9	25	13"x19"	280g/m ²
SMOOTH MULTI-USE PAPER			
Smooth Multi-Use Paper IGMUPU5	100	8.5"x11"	140g/m ²

ILFORD

INKJET PHOTO PAPER

FINE ART

ILFORD INKJET FINE ART Paper has been designed with the fine art photographer in mind. Compatible with all the latest dye and pigment based inkjet printers†† this 100% rag, acid-free paper has a smooth matte surface and is the paper of choice for all fine art applications. FINE ART offers exceptional sharpness and has a paper weight of 190gms. A true professional watercolor paper, FINE ART delivers outstanding image stability with pigment ink. A protected† FINE ART print made with pigment ink* will last 100 years***.

SPECIFICATION

INKJET FINE ART PAPER

Opacity	>96%	Caliper	400 micron
Acidity (pH)	7.8	Whiteness	96%
Weight	190 g/m ²		

AVAILABILITY

Description	Quantity	Size	Weight
Inkjet Fine Art Paper DTMFAI90	5	8.5"x11"	190g/m ²
Inkjet Fine Art Paper DTMFAI90	25	8.5"x11"	190g/m ²
Inkjet Fine Art Paper DTMFAI90	25	11"x17"	190g/m ²
Inkjet Fine Art Paper DTMFAI90	25	13"x19"	190g/m ²

* Image stability is highly dependent on the ink in your printer. Please check printer manufacturer's information for specific performance details.

***Image stability figures are based on independent accelerated testing of prints to industry standards by an independent imaging research firm. Actual print life will vary according to the nature of the image and the display conditions (light intensity, temperature and humidity). ILFORD does not guarantee the longevity of prints.

† Protected print either laminated or under glass, indoors and away from direct sunlight.

†† Please refer to the product instruction sheet or the ILFORD website

ILFOCOLOR RA-4

COLOR NEGATIVE MATERIALS

DESCRIPTION

ILFOCOLOR materials are used for the production of display prints and films from original color negatives or internegatives of all brands. ILFOCOLOR materials are compatible with all RA-4 type chemicals. The ILFOCOLOR range consists of the following products:

ILFOFLEX 2000

High Gloss Print Material

IL2000.1K

ILFOFLEX 2000 is a high-speed color photographic material coated on an opaque white polyester base guaranteeing exceptional dimensional stability, with an extremely high gloss and very sharp color images.

ILFOCOLOR RC PAPERS

Glossy Surface
Semi-Matt Surface
Glossy Surface
Semi-Matt Surface

IPRA.1M D
IPRA.24M D
ICE.1M
ICE.24M

ILFOCOLOR RC paper (IPRA) is a high-speed color photographic material on an RC base for use with either digital or analog exposure devices. Available in two surfaces; glossy (1M) and semi-matt (24M), ILFOCOLOR RC paper features high color saturation and medium contrast.

ILFOCOLOR CENTURY E RC paper (ICE) incorporates a high speed color photographic emulsion on a resin coated base. This new technology paper was specifically designed for electronic exposure devices such as laser enlargers. Available in either glossy (1M) or semi-matt (24M) wide format rolls, ILFOCOLOR CENTURY E RC paper features outstanding dye stability, crisp, clean highlights and deep, rich shadows for exceptional color and tonal reproduction.

ILFOCOLOR DISPLAY FILMS

Clear
Translucent

IC2000+.F7
IT2000+.F7

ILFOCLEAR 2000 PLUS is a high-speed color print film coated on a clear polyester base suitable for production of large display transparencies from original color negatives or internegatives of all brands. ILFOCLEAR 2000 PLUS is suitable for use with diffused light boxes and is ideal for producing overhead transparencies.

ILFOTRANS 2000 PLUS features a translucent white-pigmented layer that makes it suitable for use on light boxes without diffusers.

ILFOCOLOR RA-4

COLOR NEGATIVE MATERIALS

EXPOSURE

SAFELIGHT RECOMMENDATIONS

ILFORD does not recommend the use of any safelight with ILFOCOLOR materials.

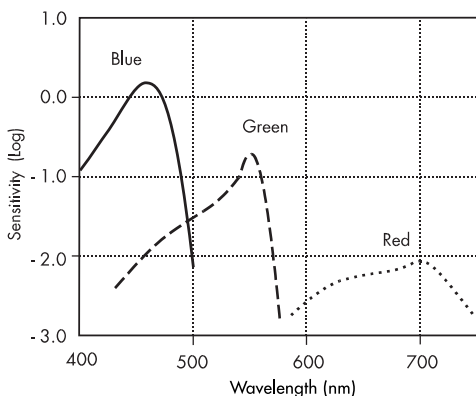
EMULSION SIDE IDENTIFICATION

In white light, the emulsion side of unprocessed material appears light purple and the reverse side, pure white. Although the emulsion side and the back have different surfaces, both sides feel similar in their smoothness. An effective way of identifying the emulsion side is by putting the materials close to the ear and swishing the thumb across one side of the material at a time. The base side of the material will make a slight whispering noise.

SPECTRAL SENSITIVITY CURVES

Following are the spectral sensitivity curves for all ILFOCOLOR materials:

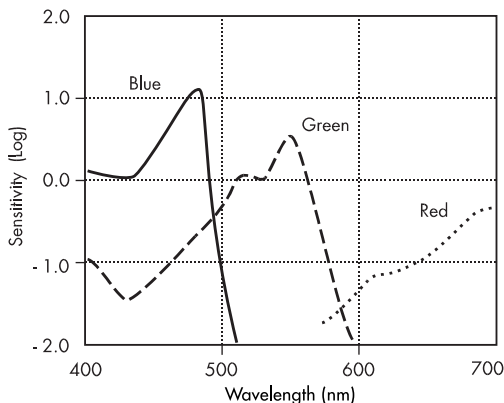
ILFOFLEX Deluxe Glossy IL2000.1K



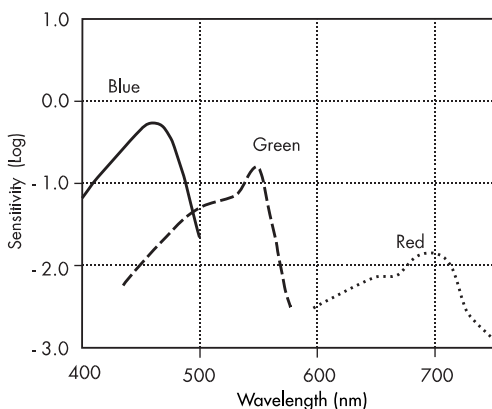
ILFOCOLOR RA-4

COLOR NEGATIVE MATERIALS

ILFOCLEAR IC2000+.F7 Film



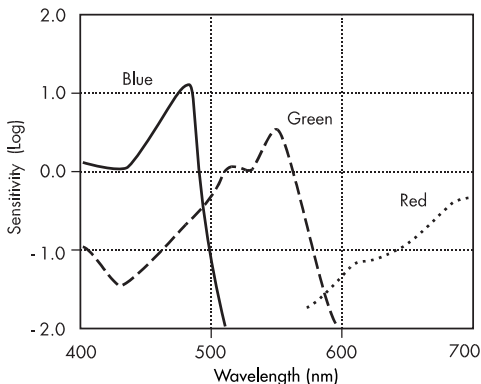
ILFOCOLOR RC Paper ICE.1M and ICE.24M



ILFOCOLOR RA-4

COLOR NEGATIVE MATERIALS

ILFOTRANS IT2000+.F7 Film



STARTING FILTRATION AND COLOR CORRECTION

When using subtractive exposure, the suggested starting filtration is:

ILFOFLEX 2000 Glossy IL2000.1K: 40Y + 30M

ILFOCOLOR Glossy & Semi-Matt
IP2000.1M and IP2000.24M: 50Y + 40M

ILFOCOLOR Display Films—
ILFOCLEAR and ILFOTRANS IC2000+.F7 and IT2000+.F7: 10Y + 50M

To adjust color filtration follow the procedures for color correcting negative-to-positive chromogenic materials.

PROCESSING

Process ILFOCOLOR materials in any brand of RA-4 chemicals. See the chemical manufacturer's recommendations for storage and keeping properties.

MACHINE PROCESSING

Contact ILFORD Imaging USA Inc for roller transport processing of ILFOCOLOR materials.

PROCESSING IN THE ILFORD ICP/IWD-42

The ILFORD ICP/IWD-42 processor is compatible with RA-4 chemicals. The chemicals should not remain in the ICP/IWD-42 processor

ILFOCOLOR RA-4

COLOR NEGATIVE MATERIALS

for longer than 5 days, since oxidation of the baths may occur. If the time between processing is longer than 1 hour, turn off the processor to help prevent possible oxidation. Most brands of RA-4 chemicals will work in this processor. Be sure to follow the manufacturer's recommendations for chemical mixing. The capacity of the chemicals is approximately 30 - 32 8x10's, or equivalent, per machine filling.

The amount of wash water is sufficient for approximately 32 8x10 inch prints. After processing 15 8x10's, one may change half the wash water for fresh, if desired. This will add a greater safety margin.

RA-4 Chemicals with the ILFORD ICP/IWD-42 Processor

Step	Solution	Temperature °F (°C)	Time
1 Develop	RA-4 Color Developer	95°F ± ⅔°F (35°C ± ⅓°C)	55 sec.
2 Bleach-Fix	RA-4 Bleach-Fixer	95°F ± ⅔°F (35°C ± ⅓°C)	55 sec.
3 Wash	Recirculating Water	95°F ± 4°F (35°C ± 2°C)	55 sec.
4 Wash	Recirculating Water	95°F ± 4°F (35°C ± 2°C)	55 sec.
5 Wash	Recirculating Water	95°F ± 4°F (35°C ± 2°C)	55 sec.
6 Dry		NOT OVER 113°F (45°C)	

PRINT FINISHING

RETOUCHING

Retouch ILFOCOLOR materials using standard retouching techniques. In general, all brands of retouching dyes can be used with ILFOCOLOR materials. ILFORD does not recommend the use of opaque retouching dyes due to the high gloss of ILFOCOLOR glossy materials and display films. If opaque retouching dyes are required, spray the print with a matt lacquer after retouching.

MOUNTING

Mount and/or laminate ILFOCOLOR materials using standard techniques for chromogenic materials.

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ILFOCHROME

CLASSIC COLOR PRODUCTS

DESCRIPTION

ILFOCHROME CLASSIC is a positive-to-positive color print material used to make prints from color transparencies. All ILFOCHROME CLASSIC materials are based on the silver dye-bleach system. ILFOCHROME CLASSIC materials use highly stable azo dyes, which are added to the emulsion layers during manufacture. During processing, the exposed image is bleached and the dyes are removed from the layers in the areas where they are not needed. The products are available in standard sheet/roll sizes and in photofinishing printer rolls.

ILFOCHROME CLASSIC DELUXE

Glossy Surface **CPS.1K, CLM.1K AND CF.1K**

These materials are coated on a white opaque polyester base. CPS.1K is a normal contrast material, CLM.1K is a medium contrast material, and CF.1K is a low contrast material. All are back coated with a matt gelatin layer to ensure flatness. CPS.1K and CF.1K are available in professional sheet and roll sizes. CLM.1K is available only in smaller sheet put-ups.

ILFOCHROME CLASSIC RC PAPERS

Glossy Surface **CPM.1M** **Pearl Surface** **CPM.44M**

These papers have a resin-coated paper base with either a glossy or luster surface. A gelatin backing layer ensures flatness before and after processing, during normal humidity conditions.

ILFOCHROME CLASSIC DISPLAY FILMS

Clear **CC.F7** **Translucent** **CT.F7**

These materials are used to make brilliant back-lit displays. Both are coated on a dimensionally stable polyester base. CC.F7, with a clear base, is used in light boxes with diffusion panels. CT.F7, with a translucent base, is used in light boxes without additional diffusion.

ILFOCHROME

CLASSIC COLOR PRODUCTS

EXPOSURE

SAFELIGHT RECOMMENDATIONS

ILFORD does not recommend the use of any safelight with ILFOCHROME CLASSIC materials.

EMULSION SIDE IDENTIFICATION

In white light, the emulsion side of unprocessed material appears green-brown and the reverse side pure white. Although the emulsion side and the back have different surfaces, both sides feel relatively similar in their smoothness. An effective way of identifying the emulsion side is by putting the material close to the ear and swishing the thumb across one side of the material at a time: the reverse side of the material will make a slight whispering noise.

ILFOCHROME CLASSIC sheet materials are always packed so that the emulsion side of the material faces the smooth side of the inner white bag. ILFOCHROME CLASSIC rolls are labeled emulsion in or emulsion out.

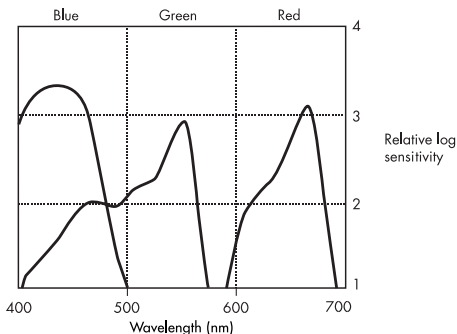
ILFOCHROME CLASSIC display sheet materials (CC.F7 and CT.F7) are notched so that the emulsion is facing the user when the notch is in the upper right hand corner. Display film rolls are wound in the same manner as the paper.



SPECTRAL SENSITIVITY CURVES

Following are the spectral sensitivity curves for ILFOCHROME CLASSIC materials.

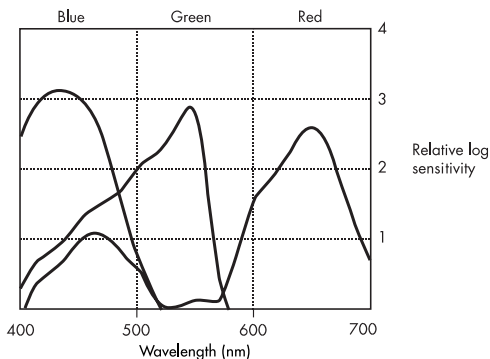
Deluxe Glossy Normal Contrast CPS.1K



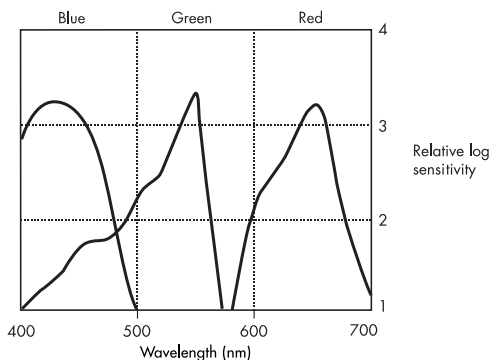
ILFOCHROME

CLASSIC COLOR PRODUCTS

Deluxe Glossy Medium Contrast CLM.1K



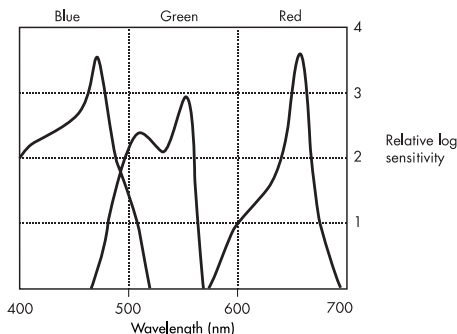
Deluxe Glossy Low Contrast CF.1K



ILFOCHROME

CLASSIC COLOR PRODUCTS

Clear CC.F7 and Translucent CT.F7 Display Films



No curves available for CPM.1M and CPM.44M at this time.

PROCESSING OPTIONS

MANUAL PROCESSING

For normal processing ILFORD recommends the use of a drum and motor base for consistent results. Adjust the rotation speed of the drum to 25 - 35 r.p.m. for processing consistency. If other drums are used, **DO NOT** use smaller volumes of processing solutions than those given by ILFORD. When manually processing ILFOCHROME CLASSIC prints 11x14 or larger, a pre-soak is recommended.

The quantity of solutions required for drum processing with P 30 chemicals is given below:

Drum Size	Quantity of Solution For Print Material	Quantity of Solution For Display Material (CC.F7 and CT.F7)
8x10 inch	75ml (2½ oz.)	150ml (5 oz.)
11x14 inch	150ml (5 oz.)	300ml (10 oz.)
16x20 inch	360ml (12 oz.)	720ml (24 oz.)

ILFOCHROME CLASSIC materials are placed inside the drum with the emulsion side in.

P 30 chemicals are recommended for use with all ILFOCHROME CLASSIC materials.

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P 30 ONE SHOT IN A DRUM WITH ILFOCHROME CLASSIC PRINT MATERIALS

Step	Treatment	Solution
1	Pre-soak	Water
2	Develop	P 30 Developer
3	Rinse	Water*
4	Bleach	P 30 Bleach
5	Fix	P 30 Fixer
6	Final Wash	Running Water
7	Dry	

P 30 ONE SHOT IN A DRUM WITH ILFOCHROME CLASSIC DISPLAY MATERIALS (CC.F7 AND CT.F7)

Step	Treatment	Solution
1	Pre-soak	Water
2	Develop	P 30 Developer
3	Rinse	Water*
4	Bleach	P 30 Bleach
5	Fix	P 30 Fixer
6	Final Wash	Running Water
7	Dry	

**The first wash is treated like a chemical bath, i.e. a measured volume at controlled temperature is added.*



Temperature Standard				
68°F±2°F (20°C±1°C)	71½ °F±2°F (22°C±1°C)	75°F±2°F (24°C±1°C)	79°F±2°F (26°C±1°C)	84°F±2°F (29°C±1°C)
30 sec.	30 sec.	30 sec.	30 sec.	30 sec.
4 min.	3½ min.	3 min.	2½ min.	2 min.
30 sec.	30 sec.	30 sec.	30 sec.	30 sec.
4 min.	3½ min.	3 min.	2½ min.	2 min.
4 min.	3½ min.	3 min.	2½ min.	2 min.
4 min.	3½ min.	3 min.	2½ min.	2 min.
NOT OVER 160 °F (70°C)				

Temperature °F	(°C)	Time
86°F ± 2°F	(30°C ± 1°C)	30 sec.
86°F ± 1°F	(30°C ± ½°C)	2 min. 15 sec.
86°F ± 1°F	(30°C ± ½°C)	30 sec.
86°F ± 1°F	(30°C ± ½°C)	3 min.
86°F ± 2°F	(30°C ± 1°C)	3 min.
86°F ± 4°F	(30°C ± 2°C)	3 min.
NOT OVER 160°F (70°C)		

ILFOCHROME

CLASSIC COLOR PRODUCTS

MACHINE PROCESSING

Contact ILFORD for machine processing of ILFOCHROME CLASSIC materials.

DRYING ILFOCHROME CLASSIC PRINT MATERIALS

ILFOCHROME CLASSIC print materials have a reddish tint when wet. Do not judge color balance until prints are completely dry.

Before drying, carefully remove excess moisture from the surface with a soft rubber squeegee or with a soft sponge. Then hang the print to dry. ILFOCHROME CLASSIC materials take approximately 1½ hours to dry at room temperature. ILFOCHROME CLASSIC prints can be dried in 5 - 10 minutes by using a hair dryer or an electric fan in a relatively dust-free area.

FINISHING ILFOCHROME CLASSIC PRINT MATERIALS AND DISPLAY FILMS

RETOUCHING

ILFOCHROME CLASSIC materials are easily retouched with transparent dyes or opaque retouching colors applied with a brush or an air-brush.

MOUNTING

Prints on ILFOCHROME CLASSIC materials can be mounted on rigid supports such as aluminum, acrylic sheets, Fome-cor, Gatorfoam, PVC sheets, etc. They are mounted to these substrates by using various tissues and mounting adhesives that are available commercially.

Print life can be extended by using laminates and other methods of print protection.

ILFOCHROME

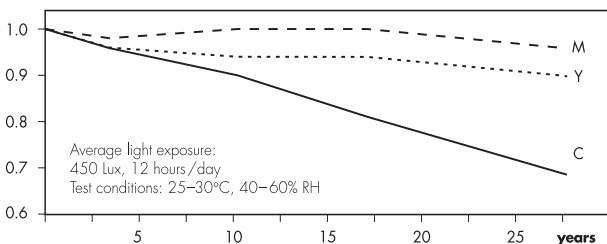
CLASSIC COLOR PRODUCTS

LIGHT STABILITY DATA

Following are light stability charts for unprotected ILFOCHROME materials. The charts are based on data from independent tests performed at the Image Permanence Institute at Rochester Institute of Technology. They do not represent standards or specifications. They can vary when using different processes or conditions.

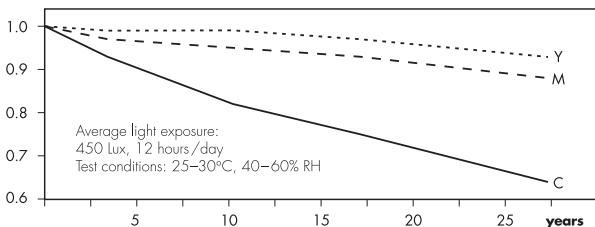
DELUXE MEDIA, CPS.1K/CLM.1K/CF.1K UNPROTECTED

Density



RC-PAPER, CPM.1M/CPM.44M UNPROTECTED

Density

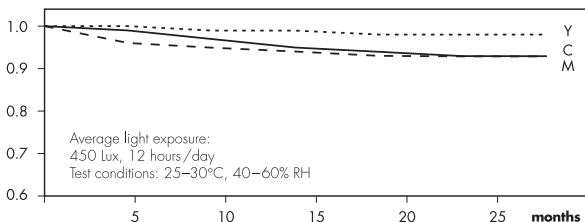


ILFOCHROME

CLASSIC COLOR PRODUCTS

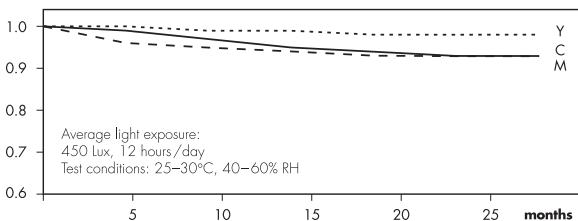
TRANSLUCENT FILM, CT.F7 UNPROTECTED

Density



CLEAR FILM, CC.F7 UNPROTECTED

Density



For illustrative purposes, unacceptable fading is defined by ILFORD according to American National Standards recommendations as an equal density loss of all three colors (yellow, magenta, cyan) of 30% measured from an original density of 1.0. However, the deviation will vary depending on scene content, and the conditions under which the printed image is viewed. This definition should be taken into account when comparing similar products from other manufacturers.

ILFOCHROME

CLASSIC P30 CHEMICALS

ILFOCHROME CLASSIC PROCESS P30 CHEMICALS

These chemicals are designed specifically to process ILFOCHROME CLASSIC print materials. They may also be used to *drum* process the ILFOCHROME CLASSIC Display Films. Process P 30 chemicals are comprised of a developer, bleach and fixer and are available in 2 liter kits.

- Easy to mix and may be partially re-used to extend chemical life
- Wide processing latitude
- Self-neutralizing
- For use in the CAP-40 or ICP42 processors

STORAGE

Store P 30 chemicals in unopened packages at 50-68°F (10-20°C). Concentrates stored in this manner will last approximately 1 to 1½ years.

Working solutions stored at room temperature in glass or polyethylene bottles designed for photographic chemicals have the following useful life:

Working Solution	Storage Conditions	Useful Life
Developer, Bleach and Fixer	Full bottles tightly capped	8 weeks
Developer, Bleach and Fixer	Partially full bottles, tightly capped	4 weeks

ILFORD

PHOTOGRAPHIC ACCESSORIES

EM10 EXPOSURE MONITOR

The ILFORD EM10 Exposure Monitor is a lightweight, easy-to-use spot enlarging meter powered by a 9-volt alkaline battery. At the tip of the meter is a 3.5mm light-sensitive cell that reads the value of the light transmitted by the enlarger. Once the monitor has been calibrated (according to the directions), all you have to do is place that 3.5mm cell in a minimum-density area of the projected image, adjust the lens opening until the green LED lights up and you have an accurate exposure!

The EM10 Exposure Monitor provides excellent print exposure accuracy with just about any negative or slide. It has a wide-range calibration dial so it can be set for any type of enlarging paper (black and white or color), for any enlarging ratio. The sturdy plastic case and solid state electronics make the EM10 Exposure Monitor shock resistant and very reliable. The battery needs to be changed only when the LEDs become dim. The EM10 is designed to give consistent results throughout the working life of the battery. Once you try the EM10 Monitor you'll realize that it truly is an indispensable tool for darkroom printing! CAT # 147 0279

ILFORD MULTIGRADE FILTERS

Each set of 12 MULTIGRADE Filters allows the user to match negatives to their needed printing grades using MULTIGRADE variable contrast paper. MULTIGRADE Filters are available in 3½"x3½", 6"x6" and below-the-lens sets (grades 00 - 5 in half-step increments). Also, available by special order only, 12"x12" in individual grades. For information on using MULTIGRADE Filters, see the Contrast Control section beginning on page 87.

ILFORD ANTISTATIC CLOTH

This long-lasting 13"x13" cloth is coated with a special formula that ensures dust-free transparencies, negatives, lenses and glass carriers. It is also excellent for use on CDs, computer screens and more! The ILFORD Antistatic Cloth is NON-WASHABLE—just use it over and over! CAT # 120 3547

CONVERSION TABLE

TO CONVERT	MULTIPLY BY	TO CONVERT	MULTIPLY BY
Centimeters into		Inches into	
Inches	.394	Centimeters	2.54
Feet	.0328	Feet	.0833
Meters	.01	Meters	.0254
Millimeters	10	Yards	.0278
Meters into		Yards into	
Centimeters	100	Inches	36
Feet	3.281	Feet	3
Inches	39.37	Meters	.914
Kilometers	.001	Miles	.0005682
Miles	.0006214	Miles into	
Millimeters	1000	Feet	5.280
Yards	1.093	Yards	1.760
Kilometers into		Kilometers	1.609
Feet	3281	Pints into	
Meters	1000	Liters	.473
Miles	.621	Quarts	.5
Yards	1093	Gallons	.125
Liters into		Quarts into	
Cups	4.226	Pints	2
Pints	2.113	Liters	.946
Gallons	.264	Gallons	.25
Milliliters	1000	Gallons into	
Quarts	1.057	Pints	8
Grams into		Liters	3.785
Ounces	.035	Quarts	4
Pounds	.002	Ounces into	
Kilograms	.001	Grams	28.35
Kilograms into		Pounds	.0625
Grams	1,000	Kilograms	.028
Ounces	35.274	Pounds into	
Pounds	2.205	Grams	453.59
		Ounces	16
		Kilograms	.454