

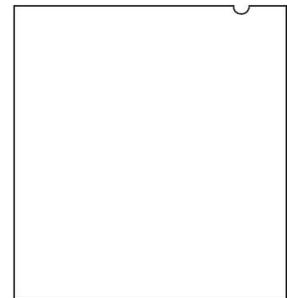
TECHNICAL INFORMATION

ORTHO PLUS

BLACK AND WHITE ORTHOCHROMATIC COPY FILM

ILFORD ORTHO Plus black and white copy film is designed for many applications. It is particularly recommended for continuous tone copy work, with no sacrifice in quality when the original includes line work. The blue and green sensitivity enables the film to be handled in red safelight and allows processing by inspection. This versatile film allows you to fine-tune the contrast by the choice of developer, the exposure given and the development time. It is possible to achieve an accurate reproduction of most black and white originals, or to maintain a clean background in copies of combined line and continuous tone originals.

The characteristic curve of ORTHO Plus copy film has been optimised to ensure the tonal range of the original image is maintained. This is different to conventional films, which can give a dull, flat result when used for copying. The qualities of a high-resolution film with precise contrast control is just what is needed for photomicroscopy. ORTHO Plus copy film is highly recommended for this application. ORTHO Plus copy film is coated on 0.180mm/7-mil polyester base, well known for its high dimensional stability and strength. The film is protected by an efficient anti-halation backing which clears during development. If processed and stored properly, ORTHO Plus copy film has excellent archival storage properties.



The emulsion faces the user when sheet film is held in the position shown with the notch top right. (above)

EXPOSURE RATING

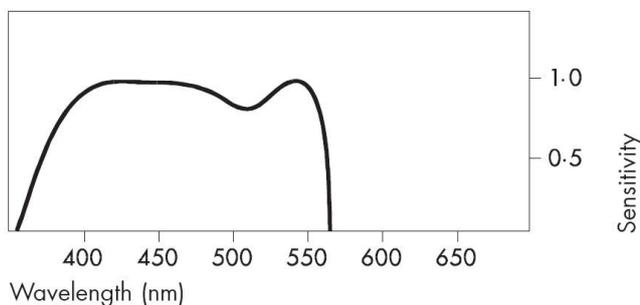
The figures below, which apply to ORTHO Plus copy film developed to normal contrast in ILFORD ID-11 developer, provide a guide to exposure:

Daylight sources ISO 80/20°

Tungsten sources ISO 40/17°

SPECTRAL SENSITIVITY

**Wedge spectrogram to tungsten light
(2850K)**



ORTHO PLUS COPY FILM Technical Information

FILTER FACTORS

The factors quoted below give a practical guide to the increase in exposure necessary when using the filters listed. For other types of filters, follow the instructions given by the filter manufacturer.

	Daylight	Tungsten
104 Alpha (yellow)	2.5	1
109 Delta (deep yellow)	5.5	3
304 Tricolour Blue	3	5
404 Tricolour Green	8	4.5

MAKING LONG EXPOSURES

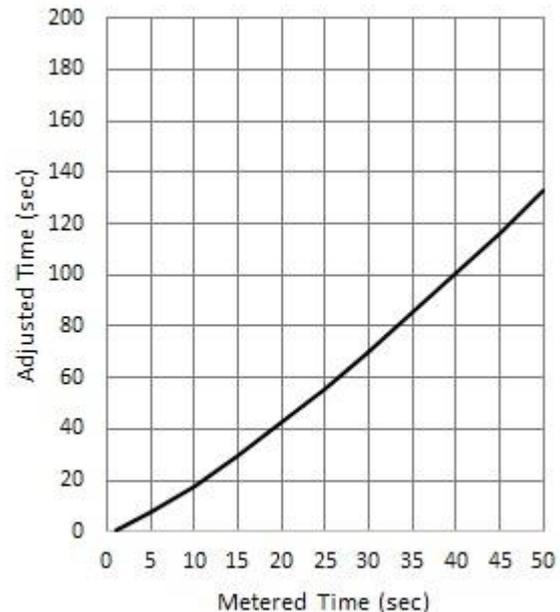
For exposures between 1 and 1/10 000 second, no adjustments are needed for reciprocity law failure.

When exposures longer than 1 second are given, ORTHO Plus copy film, along with other films, needs to be given more exposure than indicated by a meter. Use the graph to calculate the increased exposure time which should be given once the measured time is known.

The graph is based on the formulae $T_a = T_m^{1.25}$

T_a = Adjusted Time

T_m = Measured Time



CHOOSING THE BEST ILFORD DEVELOPER FOR THE JOB

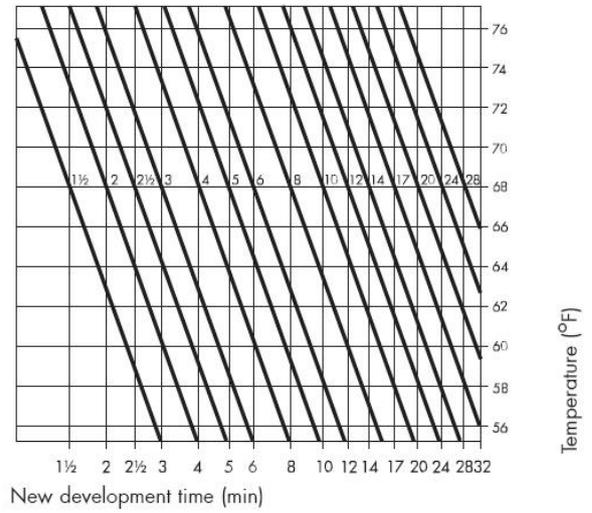
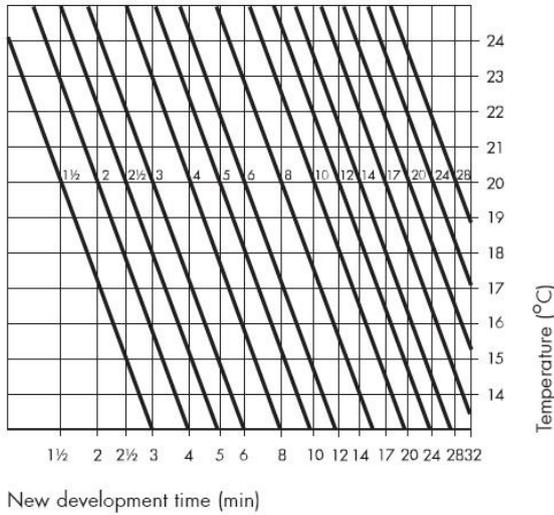
The table below gives development times in minutes for the stated contrast (Gbar). Development times may be altered if a different contrast is needed.

Pictorial Contrast		°C / °F	Min:Sec		
Developer	Dilution	Temp	Gbar 0.62	to	Gbar 0.70
ID11	Stock	20/68	8:00		10:00
	1+1	20/68	10:30		13:00
	1+3	20/68	16:00		20:00
MICROPHEN	Stock	20/68	9:00		12:00
	1+1	20/68	11:30		14:30
	1+3	20/68	13:30		17:00
PERCEPTOL	Stock	20/68	13:00		16:00
ILFOTEC HC	1+15	20/68	4:00		5:00
	1+31	20/68	6:00		8:00
ILFOTEC DD	1+4	24/75	5:30		6:30
ILFOTEC RT RAPID	1+1+2	26/79	1:05		2:07
	1+1+5	26/79	1:18		2:33
Intermediate Contrast			Gbar 0.80	to	Gbar 1.00
PQ Universal	1+9	20/68	4:00		12:00
High Contrast			Gbar 1.2	to	Gbar 1.80
PHENISOL	1+4	20/68	3:00		10:00

Note For dish/tray development with continuous agitation, reduce these times by 15%.

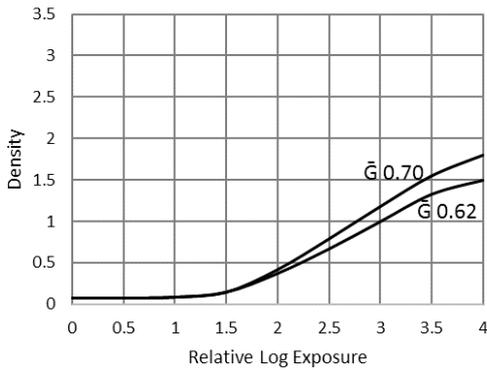
Processing at Different Temperatures

ORTHO Plus copy film can be processed over a range of temperatures. Development times at temperatures other than 20°C/68°F may be calculated from the chart below. For example, if 4 minutes at 20°C/68°F is recommended, the time at 23°C/73°F will be 3 minutes and the time at 16°C/61°F will be 6 minutes.



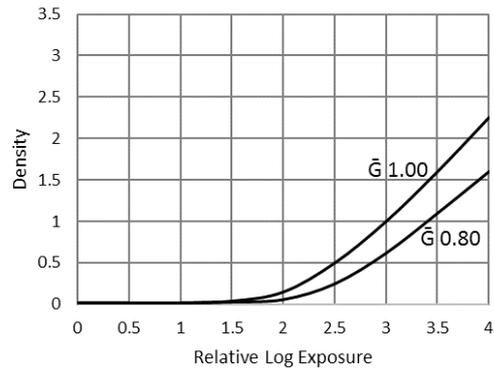
CHARACTERISTIC CURVES

Pictorial Contrast



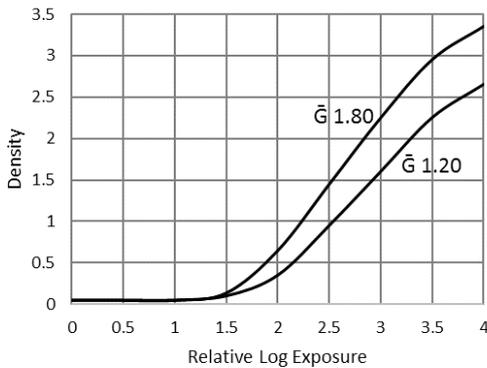
ORTHO Plus copy film developed in ILFORD ID-11 (stock) for 8 & 10min at 20°C/68°F with intermittent agitation.

Intermediate Contrast



ORTHO Plus copy film developed in ILFORD PQU (1+9) for 4 & 12min at 20°C/68°F with intermittent agitation.

High Contrast



ORTHO Plus copy film developed in ILFORD PHENISOL (1+4) for 3 & 10min at 20°C/68°F with intermittent agitation.

PROCESSING

ORTHO Plus copy film can be processed in all types of processing equipment including rotary processors, dishes/trays, deep tanks and automatic processors. Standard capacity figures and replenishment rates can be maintained.

Safelight recommendations

Use an ILFORD 906 (dark red) safelight illuminated by a 15 watt bulb. As a precaution against fogging and resultant reduced image contrast, a minimum distance of 1.2 m/4ft between the safelight and the working area is recommended. For best results, keep safelight exposure to a minimum.

Agitation

Intermittent agitation is recommended for use in deep tanks. Continuous agitation is recommended in dishes/trays by rocking the dish/tray. Otherwise, follow the recommendations given by the processing equipment manufacturer.

Stop, fix, wash and rinse

For best results it is recommended that all process solutions are kept at the same temperature or at least within 5°C (9°F) of the developer temperature.

Stop Bath

After development the film can be rinsed in water but we recommend that an acid stop bath is used such as ILFORD ILFOSTOP (with indicator dye). ILFOSTOP is also recommended for all machine processing applications. When tanks or dishes (trays) of process solutions are in use a stop bath immediately stops development and reduces carry over of excess developer into the fixer bath. This helps to maintain the activity and prolong the life of the fixer solution.

ILFORD ILFOSTOP	
Dilution	1+19
Temperature Range	18–24°C (64–75°F)
Time (sec) at 20°C (68°F)	10
Capacity, films per litre (unreplenished)	15x 20.3x25.4cm (8x10in)

The process time given is the minimum required, if necessary, a longer time may be used and should not cause any process problems provided it is not excessive.

Fix

The recommended fixers are ILFORD RAPID FIXER or ILFORD HYPAM FIXER.

ILFORD RAPID OR HYPAM FIXERS	
Dilution	1+4
Temperature Range	18–24°C (64–75°F)
Time (mins) at 20°C (68°F)	2-5
Capacity (films per litre, unreplenished)	24x 20.3x25.4cm (8x10in)

Wash

Wash the films in running water for 5–10 minutes at a temperature within 5°C (9°F) of the process temperature.

Rinse

For a final rinse use ILFORD ILFOTOL wetting agent added to water, it helps the film to dry rapidly and evenly. Start by using 5ml per litre of rinse water (1+200), however the amount of ILFOTOL used may need some adjustment depending on the local water quality and drying method. Too little or too much wetting agent can lead to uneven drying. Remove excess rinse solution from the film before drying.

Drying

Dry ORTHO Plus copy film at 30–40°C/86–104°F in a drying cabinet or at room temperature in a clean dust-free area.

STORAGE

Store ORTHO Plus copy film in a cool (10–20°C/50–68°F), dry place in its original packaging. ORTHO Plus copy film may be stored in a fridge/freezer but allow plenty of time for the film to acclimatise prior to use.

Exposed film

Once exposed, process ORTHO Plus copy film as soon as practical. Ideally before one month. Exposed films should always be stored in cool, dry conditions - as recommended above.

Negatives

Store processed negatives in a cool (10–20°C/50–68°F), dry place, in the dark. Suitable storage sleeves include those made of cellulose triacetate, Mylar, paper (pH6.5–7.5) or inert polyester.

A wide range of information sheets are available which describe and give guidance on using ILFORD PHOTO products. Some product information sheets might not be available in your country.

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