

TECHNICAL INFORMATION

# MULTIGRADE IV RC

PREMIUM QUALITY, VARIABLE CONTRAST, BLACK AND WHITE PAPER ON A CHOICE OF RESIN COATED BASES

ILFORD MULTIGRADE IV RC DeLuxe and ILFORD MULTIGRADE IV RC Portfolio are premium quality variable contrast papers.

MULTIGRADE IV RC has a bright base tint. The image colour remains cool-to-neutral whether viewed in daylight or fluorescent light.

MULTIGRADE IV RC 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 negatives and from XP2 SUPER negatives.

**MULTIGRADE IV RC DE LUXE** MULTIGRADE IV RC DeLuxe has the standard weight (190g/m<sup>2</sup>) resin coated base. It is available in three surfaces: 1M glossy, 25M satin and 44M pearl.

**MULTIGRADE IV RC PORTFOLIO** MULTIGRADE IV RC Portfolio has a double weight (250g/m<sup>2</sup>) resin coated base. It is available in two surfaces: 1K glossy and 44K pearl.

**EXPOSURE**

MULTIGRADE IV RC is designed for use with all enlargers.

**Safelight recommendations**

MULTIGRADE IV RC can be used with most common safelights for black and white papers. The ILFORD safelights are especially recommended as they generally allow darkrooms to be brighter, but completely safe, for MULTIGRADE IV RC and many black and white papers.

ILFORD safelights are the ILFORD SL1 darkroom safelight or the ILFORD 902 (light brown) safelight filter fitted in a darkroom lamp (for example, the ILFORD DL10 or DL20). A 15W bulb is recommended with these safelights.

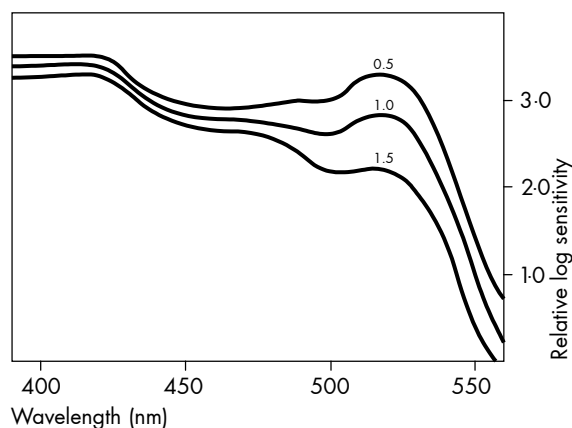
For direct lighting, do not expose the paper to the safelight for more than 4 minutes, and the distance between the paper and the safelight should be a minimum of 1.2m/4ft.

Other filters can be used, for example, the Kodak OC and the Agfa-Gevaert G7, or the Philips PF710 safelamp.

**Spectral sensitivity**

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

**Equal energy**



**Contrast range**

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

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

MULTIGRADE IV RC unfiltered has an ISO range of R110.

**ISO range**

MULTIGRADE IV RC paper and MULTIGRADE filters							
Filter	00	0	1	2	3	4	5
Range (R)	180	160	130	110	90	60	40

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

ISO range figures may be helpful to printers who have some means of measuring the effective density range of the image as projected on the enlarger baseboard – such as with a photometer. As an example, for a negative with an effective density range of 1.32 log exposure units, multiply this figure by 100 and choose the nearest ISO range figure from the table – in this case 130. Try printing this negative with MULTIGRADE filter 1 on MULTIGRADE IV RC paper.

**ISO speed**

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

**ISO paper speed**

MULTIGRADE IV RC 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 dish/tray or machine processing the paper to ILFORD recommendations.

**Exposing light sources**

MULTIGRADE IV RC 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.

**Latent image stability**

No significant change in picture quality will be seen when MULTIGRADE IV RC is left for a period of 24 hours after exposure and before processing.

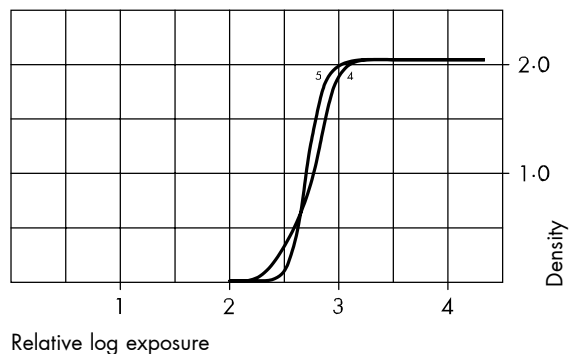
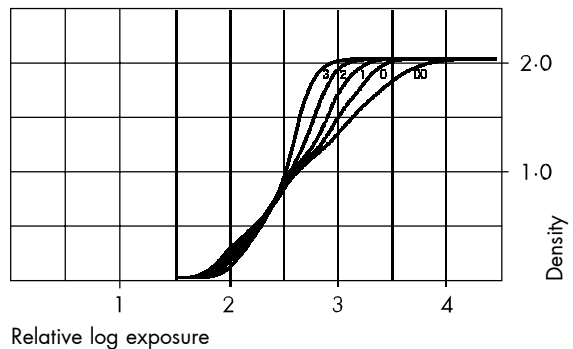
**Contrast control**

Contrast is controlled by using MULTIGRADE hand filters, the new MULTIGRADE 600 equipment, other MULTIGRADE equipment, variable contrast enlarger heads or colour enlarger heads.

The twelve MULTIGRADE filters are numbered 00–5 in ½ steps, with the lowest filter number corresponding to the softest contrast. The exposure time for filters 00–3½ is the same; that for filters 4–5 is double.

The ILFORD MULTIGRADE 600 professional exposing system replaces the standard lamphouse on the most popular professional enlargers.

**Characteristic curves**



MULTIGRADE IV RC glossy or pearl paper exposed through filters 00, 0, 1, 2, 3, 4 and 5. Developer: MULTIGRADE diluted 1+9. Development: 1 minute at 20°C/68°F.

**DISH/TRAY PROCESSING**

MULTIGRADE IV RC is processed in the same way as other resin coated papers.

**Note** Photographic chemicals are not hazardous when used correctly. Always follow the health and safety recommendations on the packaging. Photochemicals material safety data sheets containing full details for the safe handling, disposal and transportation of ILFORD chemicals are available from ILFORD.

**Processing summary** (intermittent agitation)

ILFORD chemical	Dilution	°C/°F	Time (min:sec)
<b>Development</b>			
MULTIGRADE	1+9	20/68	1:00
or MULTIGRADE	1+14	20/68	1:30
or BROMOPHEN	1+3	20/68	2:00
or PQ UNIVERSAL	1+9	20/68	2:00
<b>Stop bath</b>			
ILFOSTOP	1+19	18–24/64–75	0:10
or ILFOSTOP PRO	1+19	18–24/64–75	0:10
<b>Fixation</b>			
ILFORD RAPID FIXER or HYPAM	1+4	18–24/64–75	0:30
	1+4	18–24/64–75	0:30
<b>Washing</b>			
Fresh, running water	–	Above 5/41	2:00

**Development**

See the 'Processing summary' for development recommendations.

On correctly exposed prints with MULTIGRADE developer 1+9, the image will begin to appear after 10 seconds. 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.

To give greater control during development, and for economy, the 1+14 dilution of MULTIGRADE developer can be used.

MULTIGRADE IV RC paper can also be processed in other high quality dish/tray developers.

**Stop bath**

See the 'Processing summary' for stop bath recommendations.

The use of a stop bath is strongly recommended. A stop bath stops development immediately, reduces the risk of staining and will extend the life of the fixer bath.

**Fixation**

See the 'Processing summary' for fixing recommendations.

The use of a hardening fixer is not recommended as it reduces washing efficiency. ILFORD RAPID FIXER and HYPAM are non-hardening fixers.

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

**Washing**

See the 'Processing summary' for washing recommendations.

When it is important to obtain a print in the shortest possible time, vigorously wash MULTIGRADE IV RC paper 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**

A final rinse in ILFORD ILFOTOL, diluted 1+200 with water, will aid even and rapid drying.

Optimum quality results will be obtained with the ILFORD series of dryers, for example, the ILFOLAB 1250RC.

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** MULTIGRADE IV RC paper, as with other resin coated papers, should not be glazed/ferrotyped or dried on a drum or flatbed glazer, as this can cause the polyethylene in the paper to stick to the glazing surface.

**MACHINE PROCESSING**

MULTIGRADE IV RC paper can be processed in all conventional machines for black and white resin coated papers. It is not suitable, however, for activation type processing.

**ILFORD processors**

ILFORD 2000RT developer/replenisher and fixer/replenisher are recommended for use with all ILFORD black & white processors.

For the ILFOLAB 2150RC table-top processor ILFORD 2150XL developer and fixer kits are recommended.

**Other processors**

This section is a guide to setting up processors for ILFORD resin coated papers using ILFORD 2000RT developer/replenisher and fixer/replenisher. These are diluted 1+4 to make tank or replenisher solution. 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.

**Suggested development times**

The preferred temperature range is 20–30°C/68–86°F.

Temperature (°C/°F)	Development time (sec) including transfer time to next tank
20/68	46
25/77	32
30/86	22
35/95	15
40/104	12

These times are for non-replenished systems, with a maximum solution life of seven days. They are also for replenished systems with a solution life of up to three months. The suggested developer replenishment rate is 150–250ml/m<sup>2</sup> (14–23ml/ft<sup>2</sup>) paper processed.

**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 20°C/68°F. These recommendations are suitable for both replenished and non-replenished systems. In non-replenished systems, the maximum paper throughput is 4m<sup>2</sup>/l (44ft<sup>2</sup>/US quart) of working strength solution. The suggested fixer replenishment rate for replenished systems is 300–450ml/m<sup>2</sup> (28–41ml/ft<sup>2</sup>) of paper processed. The maximum silver concentration in the fixer bath is 4–6g/l.

**Note** If fixing is not complete, then adequate washing is impossible.

**Washing times**

Wash for at least 15 seconds at temperatures above 5°C/41°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°C/185°F.

**FINISHING**

MULTIGRADE IV RC responds in the same way as other resin coated papers to the usual techniques of toning, chemical reduction and retouching. It can be mounted using the standard techniques for resin coated papers.

**STORAGE****Unprocessed paper**

Store unused MULTIGRADE IV RC paper in a cool, dry place in its original packaging. Avoid conditions of high temperature and/or high humidity. MULTIGRADE IV RC will keep in excellent condition for up to two years when stored as recommended.

**Prints**

MULTIGRADE IV RC prints which have been processed as recommended in this leaflet will have a more than adequate storage life for most purposes. Print life will be shortened, however, in adverse storage conditions, or if the print is exposed to oxidising gases.

It is recommended that prints made for display are toned to protect them from the oxidising gases that are found in many environments. Selenium toner is recommended as it has little effect on the image colour of MULTIGRADE IV RC, but other protection methods can be used including sulphide toning, silver image stabilisers and laminating. ILFORD ILFOGUARD laminating and encapsulating films are recommended.

A wide range of fact sheets is available which describe and give guidance on using ILFORD products. Some products in this fact sheet might not be available in your country.

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