

TECHINICAL INFORMATION

MULTIGRADE RC WARMTONE

PREMIUM QUALITY, WARM TONE, VARIABLE CONTRAST, BLACK AND WHITE PAPER ON A RESIN COATED BASE

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 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

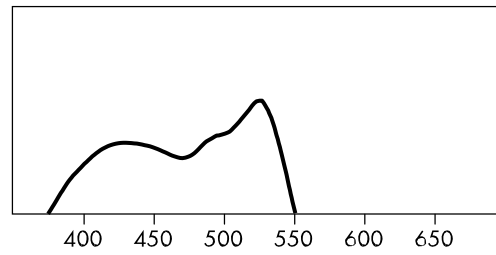
MULTIGRADE RC WARMTONE can be used with most common safelights for black and white papers. The ILFORD safelights are especially recommended as they generally allow darkrooms to be brighter, but completely safe, for MULTIGRADE RC WARMTONE and many black and white papers.

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

Wedge spectrogram to tungsten light (2850K)



Wavelength (nm)

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 and 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 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 RC WARMTONE paper.

ISO speed

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

ISO paper speed

MULTIGRADE RC WARMTONE paper and MULTIGRADE filters

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

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

Exposing light sources

MULTIGRADE RC 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.

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 1/2 steps, with the lowest filter number corresponding to the softest contrast. The exposure time for filters 00–3 1/2 is the same; that for filters 4–5 is double.

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

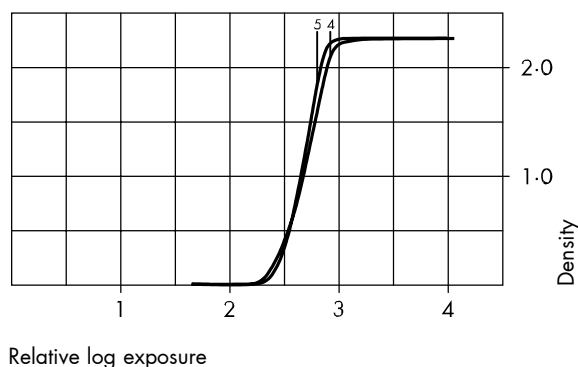
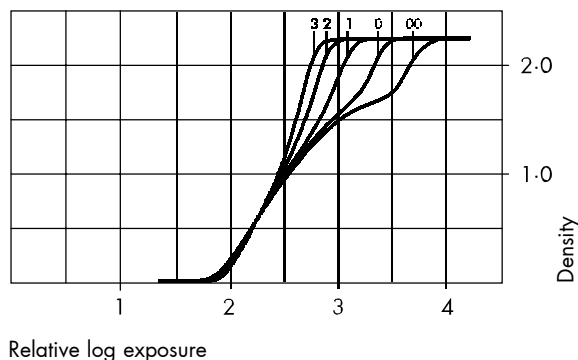
Latent image stability

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

Dimensional stability

MULTIGRADE RC WARMTONE has a high dimensional stability. When processed as recommended, sheet size will not vary by more than 0.1% between before and after processing.

Characteristic curves



MULTIGRADE RC WARMTONE 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 RC WARMTONE is processed in a similar way to other resin coated papers. Always take care when handling wet MULTIGRADE RC WARMTONE prints not to damage the emulsion with tongs.

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.

The image colour of MULTIGRADE RC WARMTONE can be varied with the choice of developer and the processing technique used.

Processing summary (intermittent agitation)

ILFORD chemical	Dilution	°C/°F	Time (min:sec)
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Development

MULTIGRADE	1+9	20/68	1:00
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or

MULTIGRADE	1+14	20/68	1:30
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or

BROMOPHEN	1+3	20/68	2:00
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or

PQ UNIVERSAL	1+9	20/68	2:00
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Stop bath

ILFOSTOP	1+19	18–24/64–75	0:10
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or

ILFOSTOP PRO	1+19	18–24/64–75	0:10
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Fixation

ILFORD RAPID	1+4	18–24/64–75	0:30
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FIXER or

HYPAM	1+4	18–24/64–75	0:30
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Washing

Fresh, running water	–	Above 5/41	2:00
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Development

See the 'Processing summary' for development recommendations.

On correctly exposed prints with MULTIGRADE developer 1+9, the image will begin to appear after about 6–7 seconds. The minimum recommended development time for high quality prints is approximately 35 seconds; after this time there is a more gradual image build-up.

Overexposed prints developed for shorter times 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.

The choice of developer affects the image colour of MULTIGRADE RC WARMTONE paper. From the ILFORD range of developers, warmest results are achieved with MULTIGRADE and BROMOPHEN developers.

MULTIGRADE RC WARMTONE 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 (which might not show until after toning) and extends 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, may impair toning performance and gives a cooler image tone. ILFORD RAPID FIXER and ILFORD 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. Also, long fixing times will affect the image colour of the paper.

Washing

See the 'Processing summary' for washing recommendations.

When it is important to obtain a print in the shortest possible time, vigorously wash MULTIGRADE RC WARMTONE 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 RC WARMTONE 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 RC WARMTONE paper can be processed in all conventional machines for black and white resin coated papers. It is not suitable, however, for activation type processing. Generally, MULTIGRADE RC WARMTONE has a slightly cooler image tone when machine processed in ILFORD chemicals, compared with dish/tray processing.

ILFORD processors

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

For the ILFOLAB 2150RC table-top processor dedicated 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/m² (14–23ml/ft²) 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 4m²/l (44ft²/US quart) of working strength solution. The suggested fixer replenishment rate for replenished systems is 300–450ml/m² (28–41ml/ft²) 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.

TONING

Toning prints creates an aesthetic effect and, in some cases, can help to protect the print from external contaminants. MULTIGRADE RC WARMTONE is receptive to a wide range of toners. Subtle colour changes or more dramatic effects are readily achieved. Especially recommended are polysulphide toners, such as Kodak Brown Toner or Agfa Viradon, and selenium toners. Other toners can be used to create different effects. Follow the instructions supplied with the toner.

FINISHING

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

STORAGE**Unprocessed paper**

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

Prints

MULTIGRADE RC WARMTONE 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. However, not all toners protect the image. Toners with a protective effect include selenium, sulphide and polysulphide toners. Other protection methods can be used including silver image stabilisers and laminating. Ideally, prints should be toned before 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