

TECHNICAL INFORMATION

# MULTIGRADE RC COOLTONE

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

ILFORD MULTIGRADE RC COOLTONE is a premium quality, variable contrast black and white photographic paper with a cool-of-neutral image tone on a cool white base. MULTIGRADE RC COOLTONE has a 190g/m<sup>2</sup> resin coated base.

MULTIGRADE RC COOLTONE is part of the ILFORD MULTIGRADE system and is fully compatible with all existing MULTIGRADE filters and equipment. It is suitable for printing all black and white negatives, including chromogenic negatives, such as ILFORD XP2 SUPER.

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

**EXPOSURE**

MULTIGRADE RC COOLTONE can be used with all enlargers – see Exposing light sources overleaf.

**Safelight recommendations**

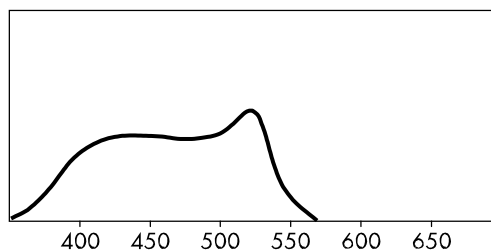
MULTIGRADE RC COOLTONE can be used with most common safelights for black and white papers. The ILFORD safelights are especially recommended as they generally allow darkrooms to be brighter, but completely safe, for MULTIGRADE RC COOLTONE and many black and white papers.

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 COOLTONE paper when used with the ILFORD MULTIGRADE speed-matched filters.

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.

MULTIGRADE RC COOLTONE unfiltered has an ISO range of R100.

**ISO range**

MULTIGRADE RC COOLTONE paper and 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 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 1.22 log exposure units, multiply this figure by 100 and choose the nearest ISO range figure from the table – in this case 120. Try printing this negative with MULTIGRADE filter 1 on MULTIGRADE RC COOLTONE paper.

**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	200	200	100	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 RC COOLTONE is designed for use 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 MULTIGRADE 600 equipment, other MULTIGRADE equipment, variable contrast enlarger heads or colour enlarger heads.

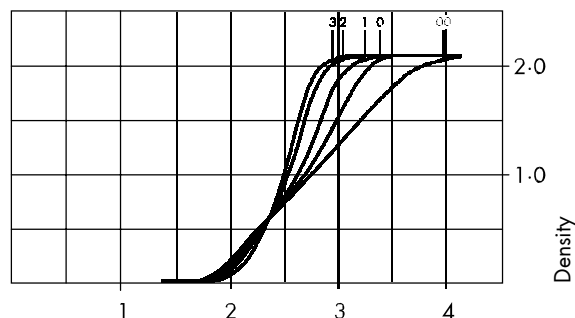
The twelve MULTIGRADE filters are numbered 00-5 in 1/2 steps, with the lowest filter number corresponding to the softest contrast. The exposure time for filters 00-3 1/2 is the same; that for filters 4-5 is double.

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

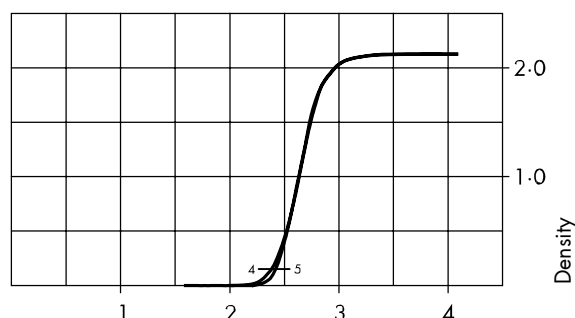
**Latent image stability**

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

**Characteristic curves**



Relative log exposure



Relative log exposure

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

**DISH/TRAY PROCESSING**

To achieve the coolest image colour, a longer development time is needed with MULTIGRADE RC COOLTONE than with other RC papers. The remaining processing steps are similar to those for 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 are available from ILFORD. They contain full details for the safe handling, disposal and transportation of ILFORD chemicals.

The image colour of MULTIGRADE RC COOLTONE 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)
<b>Development</b>			
MULTIGRADE	1+9	20/68	2:00
or MULTIGRADE	1+14	20/68	3:00
or BROMOPHEN	1+3	20/68	3:00–4:00
or PQ UNIVERSAL	1+9	20/68	3:00
<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

**Note** These longer than usual development times are needed to obtain the coolest image colour.

**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 10 seconds. Overexposed prints developed for shorter times are acceptable for those applications where the highest quality is not required. However, full development is needed to achieve the coolest image tone.

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

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

**Note** The longer development time means that the capacity of the developer is reduced by half compared with other RC papers. For example, up to 50 20·3x25·4cm(8x10in) MULTIGRADE RC COOLTONE prints can be processed in 1l/US quart of working strength MULTIGRADE developer at dilution 1+9.

**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 extends the life of the fixer bath.

**Fixation**

See the 'Processing summary' for fixing recommendations.

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

**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 COOLTONE 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 total wet times longer than about 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 COOLTONE 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 COOLTONE paper can be processed in all conventional machines for black and white resin coated papers. It is not suitable, however, for activation type processing.

Although longer than usual development times are recommended when dish/tray processing MULTIGRADE RC COOLTONE paper, standard development times are recommended when machine processing. This is because machine developers are by design more active and robust.

However, the image colour of MULTIGRADE RC COOLTONE may be less cool in machines with under active, old or heavily seasoned developer. If this occurs, mix up fresh tank developer, and it may

also be necessary to increase the developer replenishment rates.

### **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 time and temperature 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 non-replenished and 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 can be 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. Try gold or dilute selenium toners to make the image colour of MULTIGRADE RC COOLTONE paper a little cooler.

### **FINISHING**

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

#### **Prints**

MULTIGRADE RC COOLTONE prints which have been processed as recommended in this leaflet will have a more than adequate storage life for most purposes. MULTIGRADE RC COOLTONE is resistant to the effects of atmospheric pollution on images. However, print life will be shortened in some 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. Selenium toner is recommended for protection as it has little effect on the image colour. 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

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