

TECHNICAL INFORMATION

# MULTIGRADE FB WARMTONE

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

ILFORD MULTIGRADE FB 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 FB WARMTONE has a 255g/m<sup>2</sup> fibre base.

MULTIGRADE FB 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 FB WARMTONE is available in double weight 1K glossy and 24K semi-matt surfaces.

**EXPOSURE**

MULTIGRADE FB WARMTONE is designed for use with all enlargers.

**Safelight recommendations**

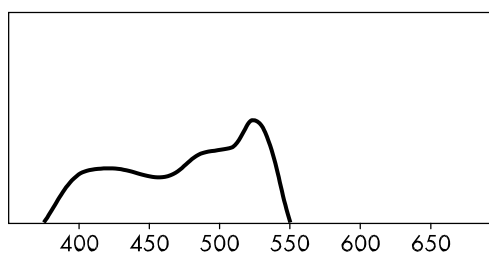
MULTIGRADE FB WARMTONE can be used with most common safelights for black and white papers. The ILFORD safelights are especially recommended as they generally allow darkrooms to be brighter, but completely safe, for MULTIGRADE FB WARMTONE and many black and white papers.

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 1.2 metres/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 FB WARMTONE paper when used with the ILFORD MULTIGRADE speed-matched filters.

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.

**ISO range**

MULTIGRADE FB WARMTONE paper and MULTIGRADE filters

Filter	00	0	1	2	3	4	5
Range (R)	170	160	130	110	90	70	50

The above values are representative of those obtained when dish/tray 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 FB WARMTONE paper.

**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 paper and MULTIGRADE filters

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

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

**Exposing 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.

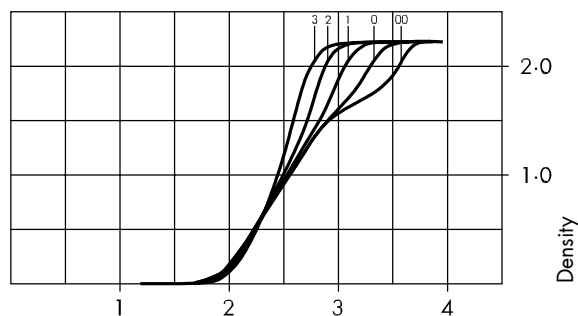
**Contrast control**

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

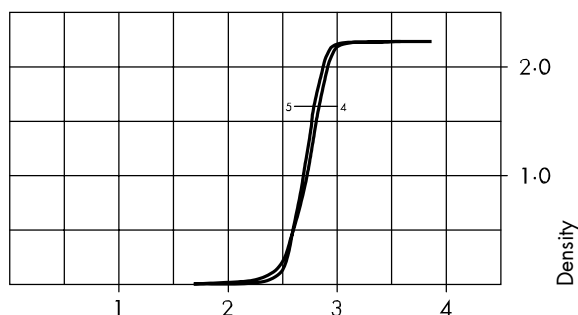
The twelve MULTIGRADE filters are numbered 00–5 in 1/2 steps, with the lowest filter number corresponding to the softest contrast. The exposure time for filters 00–3 1/2 is the same; that for filters 4–5 is double.

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

**Characteristic curves**



Relative log exposure



Relative log exposure

MULTIGRADE FB WARMTONE glossy 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.

**PROCESSING**

MULTIGRADE FB WARMTONE is processed in the same way as other fibre base 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.

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

**Processing summary** (intermittent agitation) ILFORD **Fixation**

chemical	Dilution	°C/°F	Time (min:sec)
<b>Development</b>			
MULTIGRADE	1+9	20/68	1:30–3:00
or			
MULTIGRADE	1+14	20/68	2:00–5:00
or			
BROMOPHEN	1+3	20/68	1:30–3:00
or			
PQ UNIVERSAL	1+9	20/68	1:30–3:00
<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	1:00
	1+4	18–24/64–75	1:00
<b>Washing</b>			
Fresh, running water	–	Above 5/41	60:00

**Development**

See the 'Processing summary' for development recommendations.

On correctly exposed prints with MULTIGRADE developer 1+9, the image will begin to appear after 35 seconds. Development can be extended up to 6 minutes without any noticeable change in contrast or fog.

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 FB WARMTONE paper. From the ILFORD range of developers, warmest results are achieved with MULTIGRADE and BROMOPHEN developers.

MULTIGRADE FB 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. The use of a stop bath is especially recommended with MULTIGRADE FB WARMTONE, as this paper carries over more developer to the next bath than other ILFORD fibre base papers.

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.

Short washing times, for example, when using a washing aid, will give a cooler image colour than longer washing times. For warmest results, always wash prints for at least 30 minutes.

**Drying**

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

After washing, squeegee prints on both sides to remove surplus water. Prints can be clipped back-to-back to minimise curl and air-dried at room temperature, or glazed/ferrotyped, or heat-dried. However, the use of belt print dryers and photographic blotters is not recommended as there is a risk that prints will stick to them. If a belt print dryer must be used, fix the prints using a hardening fixer; however, this will have the drawbacks explained under 'Fixation'.

**TONING**

Toning prints creates an aesthetic effect and, in some cases, can help to protect the print from external contaminants – see 'Optimum permanence'. MULTIGRADE FB 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.

**OPTIMUM PERMANENCE**

The standard fixing and washing recommendations will give excellent print permanence for all commercial needs. When optimum permanence is needed, perhaps for archival storage of prints, the following fixing and washing sequences at 18–24°C/65–75°F (including wash water) are recommended using ILFORD WASHAID. Do not add a hardener to the fixer. Be careful not to exceed the capacity of the fixer and not to extend the fixing time as both these make washing more difficult.

**Optimum permanence sequence**

Fixation	ILFORD RAPID FIXER (1+4) or HYPAM (1+4) intermittent agitation	1 min 1 min
First wash	Fresh, running water	5min
Washing aid	ILFORD WASHAID (1+4) intermittent agitation	10min
Final wash	Fresh, running water	5min*

\* Extend to 30 minutes if the warmest image colour is needed.

**Optimum permanence sequence with selenium toner**

Fixing	ILFORD RAPID FIXER (1+4), or HYPAM (1+4) intermittent agitation,	1 min 1 min
Toning	Selenium toner diluted with working strength ILFORD WASHAID instead of water, intermittent agitation	* min
Rinse	ILFORD WASHAID (1+4), intermittent agitation	10min
Final wash	Fresh, running water	30min

\* Tone the print for the appropriate time to achieve the depth of colour needed.

For optimum permanence with other toners that give a protective effect, for example, sulphide (sepia), polysulphide and some metal replacement toners (gold and platinum), use the optimum permanence sequence above and then tone the print as desired.

**Note** Other metal replacement toners such as blue (iron) and red (copper) toner may not give extra protection as the image might fade. Dye toners do not give extra protection.

**FINISHING**

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

**STORAGE****Unprocessed paper**

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

**Prints**

MULTIGRADE FB 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.