TECHNICAL INFORMATION

MULTIGRADE FB COOLTONE

PREMIUM QUALITY VARIABLE CONTRAST PAPER ON A FIBRE BASE

ILFORD MULTIGRADE FB COOLTONE is a traditional premium quality, variable contrast black and white paper on a 255g/m2 baryta coated fibre base.
It has a cool white base tint, and a cool-of-neutral image colour.
Prints made on the paper have good blacks, an excellent tonal rendition, and excellent overall print appearance.

MULTIGRADE FB COOLTONE is a fast speed paper, and although primarily designed for dish or trough processing, it can also be machine processed in suitable systems.
It has a fast processing induction time.

MULTIGRADE FB COOLTONE has good toning capabilities.

MULTIGRADE FB COOLTONE is part of the ILFORD MULTIGRADE system and is fully compatible with MULTIGRADE filters, and existing equipment.
It is suitable for printing from conventional negatives and from XP2 SUPER negatives.

MULTIGRADE FB COOLTONE is a double weight baryta coated fibre base paper – available in gloss surface (1K).

EXPOSURE

MULTIGRADE FB COOLTONE is designed for use with all enlargers.

Safelight recommendations

MULTIGRADE FB COOLTONE can be safely used with safelights that have dark orange, dark brown or red filters. eg ILFORD 904, ILFORD 902, Kodak OC, Kodak 1A, and Paterson red Dome A safelight.
A 15 W bulb is recommended with safelights.

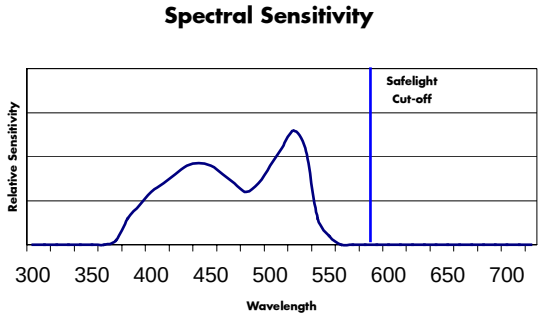
Good darkroom practices should always be adopted, by keeping safelight exposure to a minimum and always returning un-used paper to the original packaging.
Ideally, safelights should be positioned a minimum of 1.2m / 4ft away from the paper.

If in doubt as to whether a safelight is safe, tests should be carried out. Refer to the technical information sheet 'Safelighting' for how to carry this out.

Web link to Safelighting
http://www.ilfordphoto.com/applications/page.asp?n=148

Spectral Sensitivity

Wedge spectrogram to tungsten light (2856K)



Use an appropriate safelight with a cut-off of no lower than 580nm – either a dark brown or red type.

Contrast range

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

The chart below gives the ISO range figures (ISO standard 6846 – 1992) for MULTIGRADE FB COOLTONE. These figures give a guide to selecting the appropriate grade of paper for a given effective negative density range.
MULTIGRADE FB COOLTONE unfiltered has an ISO range of R85.

ISO range

MULTIGRADE FB COOLTONE paper and MULTIGRADE filters

Filter	00	0	1	2	3	4	5
Range (R)	130	115	100	85	70	55	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.

ISO speed
The speed of MULTIGRADE FB COOLTONE depends on the filtration used during exposure. MULTIGRADE FB COOLTONE unfiltered, has a paper speed of ISO P590.

ISO paper speed
MULTIGRADE FB COOLTONE paper and MULTIGRADE filters

Filter	00	0	1	2	3	4	5
Speed (P)	250	250	250	250	250	225	225

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

Film speed equivalent
ISO paper speed is different to film speed. If you wish to use this paper product in a pinhole camera, a suggested start value would be an approx film speed of ISO 6, but some experimentation will likely be required.

Exposing light sources
MULTIGRADE FB COOLTONE is designed for use with most enlargers and printers, such as 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.

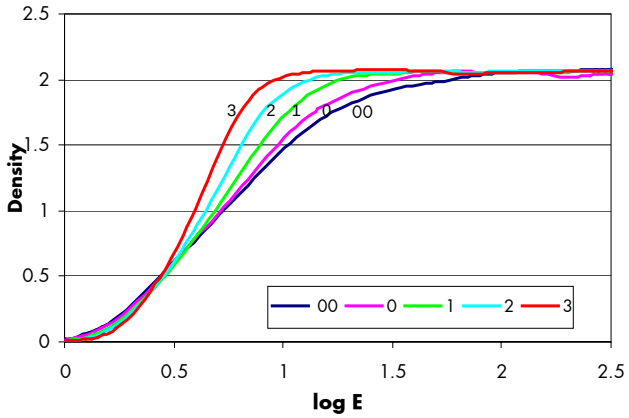
Contrast control
Contrast is controlled by using MULTIGRADE hand filters, MULTIGRADE equipment such as MULTIGRADE 500/600 systems, and variable contrast enlarger heads or colour enlarger heads.

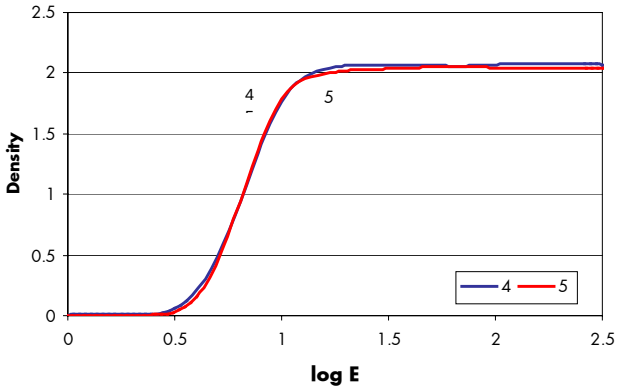
The twelve MULTIGRADE filters are numbered 00–5 in 1/2 steps, with the lowest filter number corresponding to the softest contrast.
'Guide' exposure times for filters 00–31/2 are generally the same; but filters 4–5 will need additional exposure times – typically between x1.5 to double the time.

For more information on controlling contrast with colour enlargers and variable contrast heads, refer to the technical information sheet 'Contrast control'.

Web link to Contrast control
http://www.ilfordphoto.com/Webfiles/2010628932591755.pdf

Characteristic curves





MULTIGRADE FB COOLTONE 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.

Grades 4 and 5 are shown separately due to them having increased exposure.

PROCESSING
MULTIGRADE FB COOLTONE 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.

Processing summary (intermittent agitation)

ILFORD chemical	Dilution	°C/°F	Time (min : sec)
Developer			
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
Stop bath			
ILFOSTOP	1+19	18–24/64–75	0:10
Fixer			
ILFORD RAPID	1+4	18–24/64–75	1:00
or			
HYPAM	1+4	18–24/64–75	1:00
Washing			
Fresh, running water		Above 5/41	60mins

Development
See the 'Processing summary' for development recommendations.

On correctly exposed prints with MULTIGRADE developer 1+9, the image will begin to appear at approx 25 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.

MULTIGRADE FB COOLTONE 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.

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, or heat-dried.

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

Optimum permanence sequence with selenium toner

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

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

FINISHING

MULTIGRADE FB COOLTONE responds in the same way as other fibre base papers to the usual techniques of toning, chemical reduction and retouching.
MULTIGRADE FB COOLTONE paper responds favourably to toning.

It can be mounted using the standard techniques for fibre base papers.

STORAGE

Unprocessed paper

Store unused MULTIGRADE FB COOLTONE paper in a cool, dry place in its original packaging preferably at temperatures of below 20°C / 68°F.
Avoid conditions of high temperature and/or high humidity.

MULTIGRADE FB COOLTONE will keep in excellent condition for up to three years when stored as recommended.

Prints

MULTIGRADE FB COOLTONE 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 FB COOLTONE, but other protection methods can be used including sulphide toning and silver image stabilisers.

A wide range of technical information sheets are available which describe and give guidance on using ILFORD products.

Some products in this technical information sheet might not be available in your country.

HARMAN technology Limited, Ilford Way, Mobberley, Knutsford, Cheshire WA16 7JL, England
www.ilfordphoto.com