

TECHNICAL INFORMATION

**MULTIGRADE
ART 300****PREMIUM QUALITY, VARIABLE CONTRAST, BLACK AND WHITE
PAPER ON A TEXTURED FINE ART BASE**

ILFORD MULTIGRADE ART 300 is a premium quality, variable contrast, black and white, textured art paper with a warm image tone on a neutral to cool white base.

MULTIGRADE ART 300 is coated onto a double weight 290g/m² fine art base with a textured matt surface and a slight 'eggshell' sheen. It is especially suitable for toning and hand-colouring.

MULTIGRADE ART 300 is part of the ILFORD MULTIGRADE system and is fully compatible with all existing MULTIGRADE filters and equipment. It is suitable for printing from conventional black and white negatives and XP2 SUPER negatives.

EXPOSURE

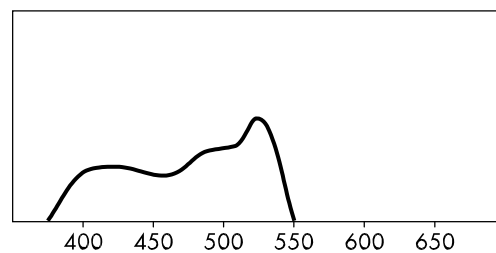
MULTIGRADE ART 300 is designed for use with all enlargers.

Safelight recommendations

MULTIGRADE ART 300 can be used with most common safelights for black and white papers including the ILFORD SL1 darkroom safelight and the ILFORD 902 (light brown) safelight filter fitted into a darkroom lamp (eg. 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, 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 ART 300 paper when used with the ILFORD MULTIGRADE speed-matched filters.

The chart below gives the ISO range figures (ISO standard 6846 – 1992) for MULTIGRADE ART 300. These figures give a guide to selecting the appropriate grade of paper for a given effective negative density range.

MULTIGRADE ART 300 unfiltered has an ISO range of R110.

ISO range

MULTIGRADE ART 300 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 ART 300 paper.

ISO speed

The speed of MULTIGRADE ART 300 depends on the filtration used during exposure. MULTIGRADE ART 300 unfiltered, has a guide paper speed of ISO P200.

ISO paper speed

MULTIGRADE ART 300 paper and MULTIGRADE filters

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

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

Exposing light sources

MULTIGRADE ART 300 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.

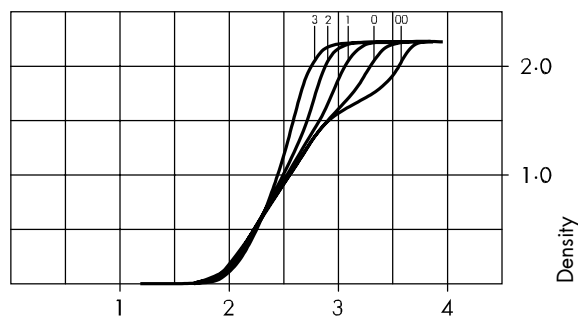
Contrast control

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

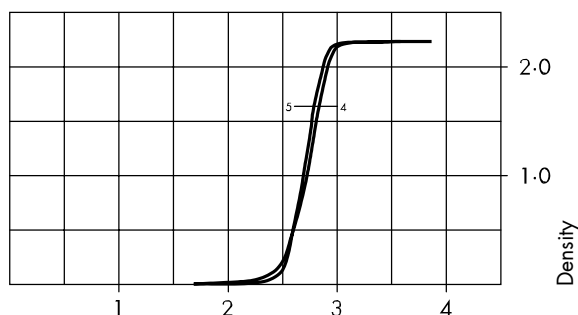
The twelve MULTIGRADE filters are numbered 00–5 in 1/2 steps, with the lowest filter number corresponding to the softest contrast. The exposure time for filters 00–3 1/2 is the same; that for filters 4–5 is approximately double.

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

Characteristic curves



Relative log exposure



Relative log exposure

MULTIGRADE ART 300 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 ART 300 can be dish processed in a similar manner to fibre base papers.

MULTIGRADE ART 300 can also be successfully processed in machines – however additional washing time is essential (See 'Machine processing' on page 4).

Note Photographic chemicals are not hazardous when used correctly. Always follow the health and safety recommendations on the packaging. Photochemical 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 ART 300 may vary dependent on 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	1:30–3:00
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
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Fixation

ILFORD RAPID FIXER or HYPAM	1+4	18–24/64–75	1:00
	1+4	18–24/64–75	1:00

Washing

Fresh, running water	–	Above 5/41	min 30min max 45min
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Development

See the 'Processing summary' for development recommendations.

On correctly exposed prints using MULTIGRADE developer at 1+9, the image will begin to appear within 15 - 30 seconds. Development can be extended up to 5 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 may affect the image colour of MULTIGRADE ART 300 paper. From the ILFORD range of developers, warmest results are achieved with MULTIGRADE and BROMOPHEN developers.

MULTIGRADE ART 300 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 ART 300, as this paper carries over more developer to the next bath than other ILFORD papers.

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 is likely to give 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, as some loss of print quality may be observed due to image etching. Long fixing times can also affect the image colour of the paper.

Washing

See the 'Processing summary' for washing recommendations.

Short washing times using washing aids such as ILFORD WASHAID to achieve 'Optimum Permanence' (see page 4), may give a cooler image colour than if using longer washing times.

NB. MULTIGRADE ART 300 prints are likely to float in the wash tank and multiple prints will tend to stick together at the water surface. Additional care will therefore be required to ensure adequate wash flow over all surfaces of the prints.

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. 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 can have drawbacks as 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 ART 300 is receptive to a wide range of toners and subtle colour changes or more dramatic effects can be readily achieved. Especially recommended are polysulphide and selenium toners, but other toners can be used successfully to create different effects. Follow the instructions supplied with the toner.

During final washing after toning, it is important to take extra care to ensure that prints are moving freely allowing full removal of any surplus toning chemicals. Inadequate circulation may result in staining of toner in patches due to uneven washing.

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. Care should be taken 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	1min 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

Fixing	ILFORD RAPID FIXER (1+4) or HYPAM (1+4) intermittent agitation	1min 1min
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	20min

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

For optimum permanence with other toners offering 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.

MACHINE PROCESSING

MULTIGRADE ART 300 can be processed in conventional processing machines such as an ILFORD 2150RC processor using ILFORD 2150XL developer and fixer.

PLEASE NOTE. When prints exit the processing machine, it is unlikely that they will be dry however this should not be an issue because MULTIGRADE ART 300 prints will always need an additional 30 minute wash. Processors' wash times are simply too short to ensure print permanence and if no additional washing is given, yellow staining is likely to occur due to residual chemicals in the print. Following additional washing, prints can be properly dried as detailed under 'Drying' on page 3.

FINISHING

MULTIGRADE ART 300 responds in a similar way to fibre base papers to the usual techniques of chemical reduction and retouching. It can also be mounted using the standard techniques for fibre base papers.

STORAGE Unprocessed paper

Store unused MULTIGRADE ART 300 paper in a cool, dry place in its original packaging. Avoid conditions of high temperature and/or high humidity. MULTIGRADE ART 300 will keep in excellent condition for up to two years when stored as recommended.

Prints

MULTIGRADE ART 300 prints which have been processed as recommended in this technical information sheet 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 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.

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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