KODAK PROFESSIONAL POLYCONTRAST IV RC Paper

Discontinuance of KODAK PROFESSIONAL Black & White Photographic Papers

Due to the ongoing transition to digital output technologies in both professional and educational markets, Kodak has announced manufacturing discontinuance of Black & White Photographic Papers. Sales will cease by the end of 2005.

KODAK Black & White Films and Black & White Processing Chemicals will continue to be produced.

The final availability of specific Black & White papers will vary based on type, size, configuration and surface. Please contact your normal supplier of KODAK PROFESSIONAL Products for the latest information.

KODAK PROFESSIONAL POLYCONTRAST IV RC Paper is a fast, selective-contrast, black-and-white enlarging paper with a resin-coated base. This medium-weight paper features a wide contrast range and a neutral-black image tone. It is useful for a variety of applications such as advertising, aerial, commercial, education, finishing, industrial, law enforcement, mapping, medical, military, photo hobbyist, and photojournalism.

POLYCONTRAST IV RC Paper is intended for tray (dish) and roller-transport, rack-and-tank, or continuous machine processors using conventional developers.

FEATURES	BENEFITS
• Very rich blacks	• Intense saturated blacks, especially when dried using infrared dryers
• Excellent image quality	• Extremely sharp prints
• Improved highlight tone reproduction	• Exceptional results for highlight detail, allowing more flexibility in processing for students as well as experienced users
• Extensive tonal range	• Produces excellent tonal quality
• Excellent process latitude	• Accommodates an extremely wide range of times and temperatures with consistently good results
• Optically brightened support and emulsion	• Clean, brilliant, neutral whites • Excellent D-min
• Neutral image tone	• Neutral results, but easily toned to adjust for preference
• Rich color with KODAK Sepia II Warm Toner	• Provides a traditional sepia tone
• Extremely good post-processing life	• Long print life • Excellent print stability • Highest-quality resin-coated (base) support
• Nominal “white light” grade number of 2.5	• Designed to print most negatives without filtration at maximum speed • Improves printer productivity
• Wide contrast range	• Accommodates a wide range of negative contrasts
• Specially stabilized support	• Paper stays white
• Resin-coated, water-resistant base	• Rapid processing without edge penetration, fast drying, minimum curl

Base and Surface Characteristics

Symbol	Texture	Surface	Base Tint	Base Weight
F	Smooth	Glossy	White	Medium Weight
N		Semi-Matt		
D		Fine Lustre		
E	Fine-Grain	Lustre		

STORAGE AND HANDLING

Store paper in a cool, dry place (preferably at or below 70°F [21°C] and at a relative humidity of 30 to 50 percent). High temperature or high humidity may produce undesirable changes. Always rewrap unused paper in its original packaging (the outer box as well as the bag) to protect it from light and moisture. Avoid or shield the paper from exposure to radioactivity or x-rays.

DARKROOM RECOMMENDATIONS

Use a KODAK OC Safelight Filter (light amber) in a suitable safelight lamp with a bulb of 15 watts or less at least 1.2 metres (4 feet) from the paper. Minimize safelight exposure to avoid unwanted quality changes. **Be especially careful** if you use other types of safelights.

See KODAK Publication No. K-4, *How Safe is Your Safelight?,* for information on safelight testing.

Note: Do not use a KODAK OA Safelight Filter (greenish yellow).

EXPOSURE

Light Source

Expose this paper with tungsten or tungsten-halogen enlarger lamps, and automatic printers. You can use other light sources, such as cool-white fluorescent lamps or mercury-vapor lamps, or cathode-ray tubes, but you may need to use color correction filters in *addition* to contrast control filters. For best results, make test prints to determine the optimum filtration for each light source.

If you use a subtractive color-head enlarger with dichroic filters, magenta and yellow filtration may not be sufficient to achieve the highest and lowest contrast the paper can deliver. In this circumstance, if the white light mode is available, use POLYMAX 5+ and –1 Filters.

Suggested starting points for other light sources are listed below. Make a test print to determine the best filtration for each light source.

Enlarging Lamp	KODAK Color Compensating Filter or KODAK Color Printing Filter
Cool white fluorescent	CP40Y or CC40Y
Daylight fluorescent	CP70Y or CC70Y

Note: Use optical-grade gelatin KODAK Color Compensating (CC) Filters between the negative and the paper. Use acetate KODAK Color Printing (CP) Filters between the light source and the negative.

Filters

To achieve the widest possible contrast range with this paper, use KODAK POLYMAX Filters. These filters provide twelve contrast increments with improved contrast spacing with this paper.

You can use the POLYMAX Filter *Set* above or below the enlarger lens (light path). The POLYMAX Filter *Kit* is similar to the set except it's mounted in plastic filter mounts. You can use these filters below the enlarger lens (in the optical path). They are supplied in a hinged plastic box with a filter holder and adapters to fasten the holder to the red filter post or to the lens.

You can also use other manufacturers' filters with this paper, but results may not be the same. For critical applications, make tests to determine the paper contrast.

The filter kit, filter sets, and filter upgrade sets are now distributed by Tiffen Co. L.L.C. In the U.S. call 800-368-6257 or view their website at **www.tiffen.com.**

ISO Paper Speed and Range

Note: The numbers for Paper Range indicate the relative ISO ranges of different contrasts produced with KODAK POLYMAX Filters. The ranges were calculated from the log exposure ranges of the paper. Use them as a guide when selecting the appropriate paper contrast for the density range of a specific negative. When the ISO range of the paper approximately equals 100 times the density range of the negative, the contrast of the print will usually be satisfactory. (For convenience, the log exposure ranges have been multiplied by 100 so that the ISO ranges are expressed as whole numbers.) The contrast you choose will also depend on the nature of the subject.

F Surface

KODAK POLYMAX Filter		None	-1	0	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5+
KODAK PROFESSIONAL POLYMAX RT Developer and Replenisher	Paper Speed	P500	P320	P320	P320	P320	P320	P320	P320	P320	P320	P125	P125	P125
	Paper Range	R100	R140	R140	R130	R120	R120	R110	R110	R90	R80	R70	R60	R50
KODAK PROFESSIONAL DEKTOL Developer	Paper Speed	P500	P250	P250	P250	P250	P250	P250	P250	P250	P250	P125	P125	P125
	Paper Range	R100	R140	R140	R130	R130	R120	R120	R110	R100	R80	R70	R50	R40

N Surface

KODAK POLYMAX Filter		None	-1	0	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5+
KODAK PROFESSIONAL POLYMAX RT Developer and Replenisher	Paper Speed	P500	P320	P320	P320	P320	P320	P320	P320	P320	P320	P125	P125	P125
	Paper Range	R90	R120	R120	R120	R110	R110	R100	R110	R90	R80	R60	R50	R40
KODAK PROFESSIONAL DEKTOL Developer	Paper Speed	P500	P250	P250	P250	P250	P250	P250	P250	P250	P250	P125	P125	P125
	Paper Range	R90	R130	R130	R120	R110	R110	R110	R100	R90	R80	R60	R40	R40

E Surface

KODAK POLYMAX Filter		None	-1	0	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5+
KODAK PROFESSIONAL POLYMAX RT Developer and Replenisher	Paper Speed	P500	P320	P320	P320	P320	P320	P320	P320	P320	P320	P125	P125	P125
	Paper Range	R110	R140	R140	R130	R120	R120	R110	R110	R100	R80	R70	R60	R50
KODAK PROFESSIONAL DEKTOL Developer	Paper Speed	P500	P250	P250	P250	P250	P250	P250	P250	P250	P250	P125	P125	P125
	Paper Range	R110	R140	R140	R130	R120	R120	R110	R110	R100	R80	R70	R60	R50

Note: KODAK PROFESSIONAL POLYMAX RT Developer and Replenisher for 15 seconds at 37.8°C (100°F)
KODAK PROFESSIONAL DEKTOL Developer (1:2) for 60 seconds at 20°C (68°F).

Filtration Values for Common Black-and-White and Color Enlargers

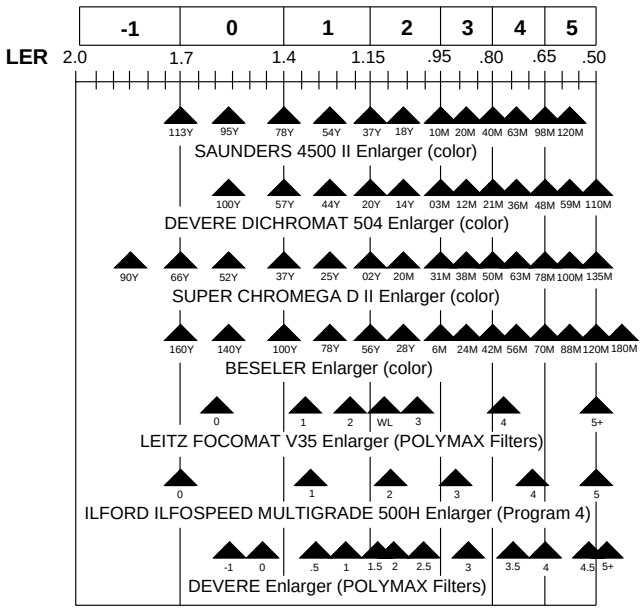
The contrast of selective grade papers is adjustable through changes in the color of the light exposing the paper. Because enlarger lamps and filters can vary from one manufacturer or model to the next, the contrast performance of POLYCONTRAST IV RC Paper can also vary depending upon the equipment used.

ANSI standards define a contrast method called “Log Exposure Range” (LER). Kodak relates LER to paper grade numbers to classify seven degrees of contrast. You can use the information in the following chart as a guide for selecting the filtration required to achieve a desired paper grade when printing with some commonly available color and black-and-white enlargers.

The age of the lamp and the condition of the enlarger and filters can affect the contrast you will actually achieve. Use the data in the chart as a starting point only. If you cannot obtain as high a contrast as indicated in the chart, examine the light filter mixing chamber. This chamber often yellows with age, imparting a permanent low-contrast bias to the enlarger. Replace the chamber’s lining as appropriate with fresh white material. If you still cannot obtain as high a contrast as indicated, you may have to replace the magenta filter. Compared to yellow filters, magenta filters are more susceptible to fading caused by heat.

The data for the chart was generated by placing a step tablet in contact with the paper on the easel. Slightly different results are obtained using a step tablet at the negative gate.

KODAK PROFESSIONAL POLYCONTRAST IV RC Paper
Grade Numbers for Various Enlargers
in KODAK PROFESSIONAL POLYMAX RT Developer
and Replenisher, 100°F (38°C)



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Examples: With a DEVERE DICHROMAT 504 Enlarger (color head), you can obtain paper grade 1 with 44Y dichroic filtration. To obtain paper grade 4, dial in 36M filtration.

With the same enlarger, if you dial out all filtration to give white light, using a POLYMAX 4 Filter will yield paper grade 4.5.

PROCESSING

Tray Processing

Tray process with continuous agitation at 68°F (20°C), using the appropriate dilution and development time recommended in the table.

KODAK PROFESSIONAL Chemical	Dilution (chemical: water)	Time (min:sec)	Capacity (8 x 10-inch Prints per gal/L)
Developer— 20°C (68°F)			
POLYMAX T	1:9	1:00	120/32
DEKTOL (powder)	1:2	1:00	120/32
DEKTOL (liquid)*	1:9	1:00	120/32
D-72 (formula)	1:2	1:00	100/26
Stop Bath—18 to 24°C (65 to 75°F)			
Indicator	1:63	0:10	80/20†
EKTAFLO	1:31	0:10	80/20†
Fixer/Replenisher (single bath)‡— 18 to 24°C (65 to 75°F)			
Non-hardening fixer (for general printing and for toning):			
Rapid Fixer, Solution A (do not use Solution B)	1:7	2:00	100/26
Hardening fixers (for general printing)§			
KODAK Fixer	—	2:00	100/26
POLYMAX T	1:7	2:00	100/26
KODAFIX	1:7	2:00	100/26
Rapid Fixer (Solution A and B)	1:7	2:00	100/26
Wash— 10 to 30°C (50 to 86°F)			
	—	4:00	—

*Provides greater development latitude.
†Discard the solution when color changes to a purplish blue.
‡To increase capacity, use two fixing baths.
§Using a hardening fixer makes toning less efficient. For the same amount of processing time, you'll see less of a toning effect.

Developing

Immerse prints face up, flexing the paper so the entire surface gets wet as it goes into the developer. Drain prints for the last 5 seconds before immersing in stop bath.

Stop Bath

Bathe prints for at least 10 seconds at 18 to 24°C (65 to 75°F) with continuous agitation in KODAK PROFESSIONAL EKTAFLO Stop Bath, KODAK PROFESSIONAL Indicator Stop Bath, or 48 mL KODAK 28% Acetic Acid and water to make 1 L.

With EKTAFLO or Indicator Stop Bath, discard the solution when the color changes to purplish blue. Change Acetic Acid and water stop bath after approximately twenty 8 x 10-inch prints per litre (eighty 8 x 10s per gallon).

Fixing

Fix prints at 18 to 24°C (65 to 75°F) with frequent agitation. With KODAK PROFESSIONAL POLYMAX T Fixer, KODAK PROFESSIONAL Rapid Fixer, or KODAFIX Solution, fix for 2 minutes if you use a single bath. If you use two fixing baths, fix prints for 1 minute in each bath, draining for 5 seconds between baths.

Proper fixing is important. Underfixing will leave residual silver halide in the emulsion, which will darken or stain with exposure to light. Overfixing will make washing more difficult, and may slightly bleach the print.

Note: Using a hardening fixer makes toning less efficient. For the same amount of processing time, you'll see less of a toning effect.

Washing

Wash for at least 4 minutes in running water at 10 to 30°C (50 to 86°F), interleaving the prints carefully and frequently.

Avoid prolonged fixing or washing times to realize all advantages of this water-resistant base, and to minimize physical damage, edge penetration, and curl.

Drying

Remove excess water from the front and back of prints with a clean squeegee, soft viscose sponge, or lintless blotter. Air-dry prints at room temperature or with warm air, or use a dryer intended for resin-coated papers.

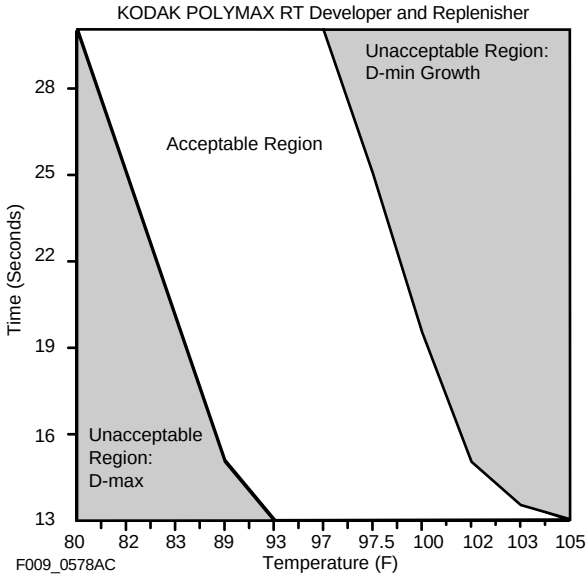
Ferrotyping (glazing) prints is **not** recommended. You can use ferrotype dryers (glazers) at temperatures below 88°C (190°F) if you place the print's base side against the drum or platten surface.

Machine Processing

For rapid processing of this paper, you can use roller-transport and continuous processors that use conventional developers.

Processor	Developer	Fixer
Roller-Transport, Rack-and-Tank, Continuous	KODAK PROFESSIONAL POLYMAX RT Developer and Replenisher	KODAK PROFESSIONAL POLYMAX RT Fixer and Replenisher OR KODAK PROFESSIONAL Rapid Fixer, Solution A

Machine Process Window Time and Temperature



POST-PROCESS TREATMENTS

Except for treatment with a toner solution, post-processing treatments generally don't improve the image stability of prints on Kodak black-and-white papers. Some treatments—for example, laminating—provide physical protection. Some may actually have an adverse effect on prints. The effects of post-processing treatments on prints vary widely with the type of treatment and the manner in which the treatments are applied.

Toning

Treatment with a toner extends the life of prints that may be exposed to oxidizing gases or subjected to adverse storage or display conditions. KODAK PROFESSIONAL Toners will protect prints whether or not they produce a tone shift.

Tone Shift with KODAK PROFESSIONAL Toners

Processing	Full	Full to Moderate	Slight	None*
Tray (DEKTOL Developer)	Sepia II Warm or Brown	Sepia†	Rapid Selenium (1:3) (1:9) (1:20)	Rapid Selenium (1:40)

*Recommended for print protection. No color change.
†KODAK Sepia Toner will lighten print density during toning. To tone this paper in Sepia Toner make your prints significantly darker than normal. Make an initial series of test prints to determine how much extra density you'll need for this paper with a given developer.

For more information on toning, see KODAK Publication No. G-23, *Toning KODAK Black-and-White Materials*. It explains the technique of toning, and describes Kodak toners and their effects on Kodak black-and-white papers and films.

Retouching

Although KODAK Liquid Retouching Colors (CAT 190 1743, Set of 9 liquid dyes) are intended primarily for color prints, you can use the Neutral (CAT 190 2378) dye to retouch black-and-white prints, or mix the colored dyes to match toned black-and-white prints.

To correct or eliminate spots or scratches, add density to the area using KODAK Liquid Retouching Color, Neutral (CAT 190 2378). If the Neutral dye color does not completely match, adjust the color by adding small amounts of either Red (CAT 190 2246) or Cyan (CAT 190 2345) Liquid Retouching Color to "warm" or "cool" the tone.

Lacquering and Laminating

Use lacquers with caution. If you choose to lacquer your prints, select a lacquer that is specifically intended for photographic applications.

Apply multiple light coats rather than a single thick coat of lacquer. Never allow a lacquered print to come into contact with the glass in a picture frame, because it may stick to the glass.

Laminating is really a variation on lacquering. Instead of a very thin polymer layer, laminating produces a much thicker layer. Laminates may contain UV absorbers, plasticizers, and matting agents. They provide protection against fungus and bacterial attack, moisture and dirt in the air, and physical abrasion.

Mounting

Mounting provides rigidity, helps prevent wrinkling, and gives some physical protection to prints.

For long-term keeping, it is best not to use adhesives or dry-mounting tissue. The best mounting method is to use plastic corners or hinge the print by using Japanese rice paper and water-soluble wheat paste. Do not use rubber cement, contact cement, or animal glue. If you must use a liquid adhesive, use starch paste or polyvinyl chloride.

If you choose to dry-mount your prints, use acid-free, pH-buffered, conservation-quality mounting board and conservation-quality mounting tissue.

Note: Mounting glossy RC prints with dry-mounting tissue can introduce an "orange peel" effect.

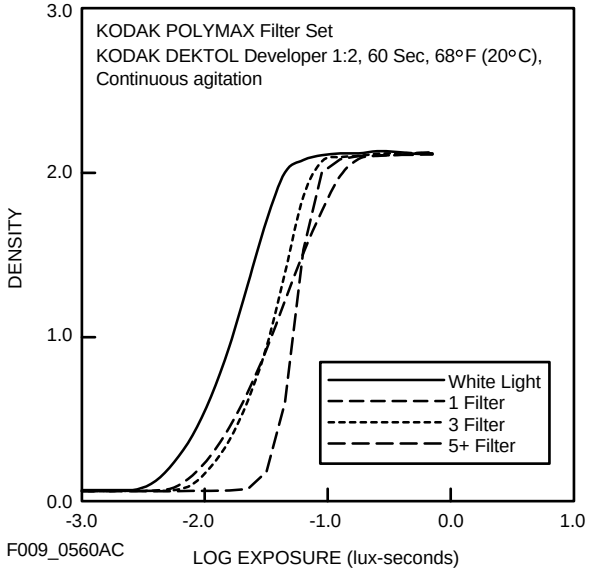
An overmat, or window mat, will help protect a print from abrasion, keep the emulsion away from the glass in a frame, and provide a neutral or complementary field. Be sure to use conservation-quality mat boards and backing and non-reactive framing materials.

For more information on laminating, lacquering, and mounting, see KODAK Publication No. E-67, *Finishing Prints on KODAK Water-Resistant Papers*, or No. F-35, *Protecting and Displaying Black-and-White Prints.*

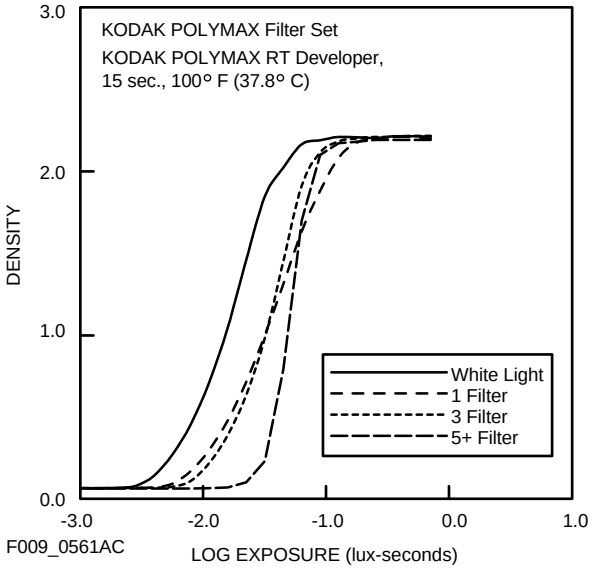
CURVES

Characteristic Curves

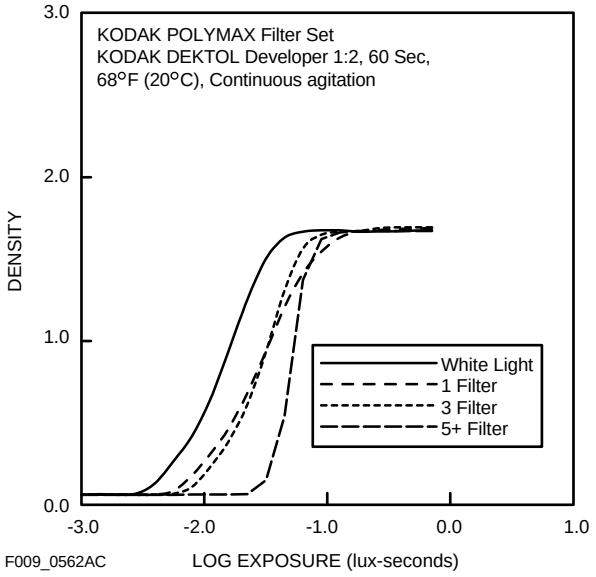
F Surface, KODAK POLYMAX Filters
Tray Processed in KODAK DEKTOL Developer



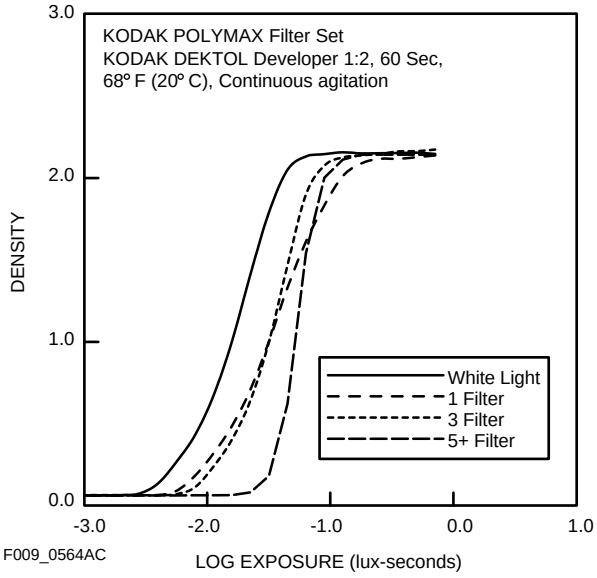
F Surface, KODAK POLYMAX Filters
Machine Processed in KODAK POLYMAX RT Developer



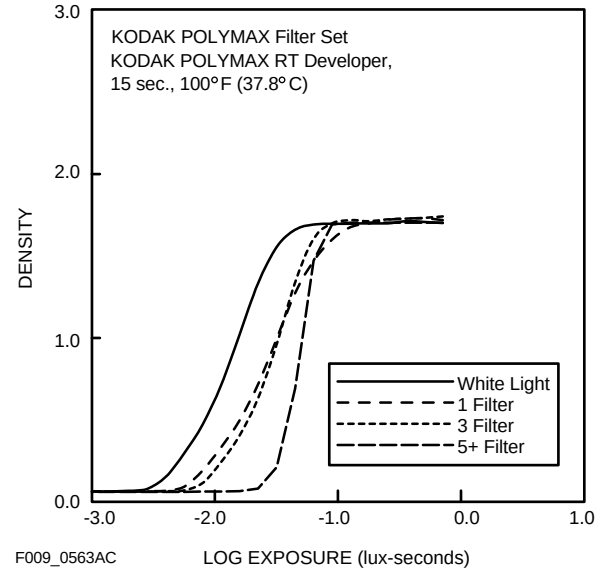
N Surface, KODAK POLYMAX Filters
Tray Processed in KODAK DEKTOL Developer



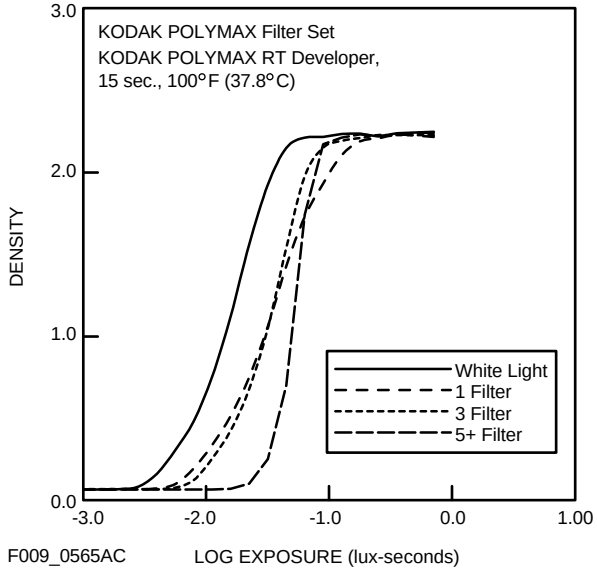
E Surface, KODAK POLYMAX Filters
Tray Processed in KODAK DEKTOL Developer



N Surface, KODAK POLYMAX Filters
Machine Processed in KODAK POLYMAX RT Developer

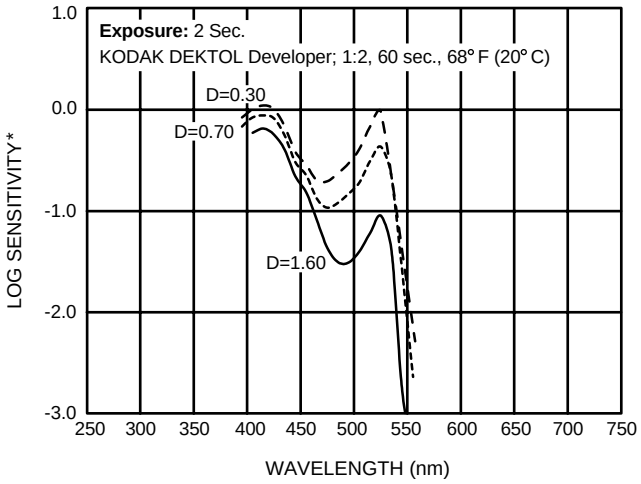


E Surface, KODAK POLYMAX Filters
Machine Processed in KODAK POLYMAX RT Developer



NOTICE: The sensitometric curves and data in this publication represent product tested under the conditions of exposure and processing specified. They are representative of production coatings, and therefore do not apply directly to a particular box or roll of photographic material. They do not represent standards or specifications that must be met by Eastman Kodak Company. The company reserves the right to change and improve product characteristics at any time.

Spectral-Sensitivity Curves



*Sensitivity = reciprocal of exposure (erg/cm^2) required to produce specified density

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MORE INFORMATION

Kodak has many publications to assist you with information on Kodak products, equipment, and materials.

The following publications are available from Kodak Customer service, from dealers who sell Kodak products, or you can contact Kodak in you country for more information.

E-30	*Storage and Care of KODAK Photographic Materials—Before and After Processing*
E-67	*Finishing Prints on KODAK Water-Resistant Papers*
E103BP	*KODAK PROFESSIONAL Black-and-White Papers Matrix*
E103CP	*Chemicals for KODAK PROFESSIONAL Black-and-White Papers Matrix*
F-2	*Pathways to Black and White*
F-35	*Protecting and Displaying Black-and-White Prints*
G-23	*Toning KODAK Black-and-White Materials*
J-5	*KODAK PROFESSIONAL POLYMAX T Developer and KODAK POLYMAX T Fixer*
K-4	*How Safe is Your Safelight?*

For the latest version of technical support publications for KODAK PROFESSIONAL Products, visit Kodak on-line at:
http://www.kodak.com/go/professional

If you have questions about KODAK PROFESSIONAL Products, call Kodak.
In the U.S.A.:
1-800-242-2424, Ext. 19, Monday–Friday
9 a.m.–7 p.m. (Eastern time)
In Canada:
1-800-465-6325, Monday–Friday
8 a.m.–5 p.m. (Eastern time)

Note: The Kodak materials described in this publication for use with KODAK PROFESSIONAL POLYCONTRAST IV RC Paper are available from dealers who supply KODAK PROFESSIONAL Products. You can use other materials, but you may not obtain similar results.

EASTMAN KODAK COMPANY

Kodak Professional
Imaging Solutions

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