Pathways to Black and White

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INTRODUCTION

The pathway you choose to produce a finished black-and-white image will depend on your original and your specific application. The most fundamental path is to make a positive black-and-white reflection print from a black-and-white negative. The following shows a wide variety of ways to arrive at your final image.

KODAK BLACK-AND-WHITE FILMS

General picture-taking continuous-tone films, such as KODAK PROFESSIONAL TRI-X 400 Film or KODAK PROFESSIONAL T-MAX Films, are usually used to make black-and-white enlargements on conventional black-and-white papers. However, you can also use some films to make positive slides, copy negatives or display transparencies in a range of contrasts.

Copy negatives are usually negatives made by photographing black-and-white reflection prints. For best results, use KODAK PROFESSIONAL T-MAX 100 Film.

Kodak also makes a variety of continuous-tone black-and-white chemicals for processing these films.

For special-purpose applications, you may have to use a conventional developer in a non-conventional way or use a special-purpose developer. This applies especially when you need to alter the contrast of the original. You may want to experiment with some special-purpose developers such as KODAK Developer D-19 and the KODAK T-MAX 100 Direct Positive Film Developing Outfit.

KODAK BLACK-AND-WHITE PAPERS

Kodak papers are either *fiber-base* or *resin-coated* (RC), and available in graded- or selective-contrast types. Generally, their most common function is to make black-and-white reflection positives (prints) from black-and-white film negatives.

Fiber-Base Papers. These papers are made from a chemically pure paper base coated with a bright white barium sulfate layer over which the emulsion is coated. This base is highly absorptive and requires relatively long wash times to remove processing chemicals.

Resin-Coated Papers. These papers are coated with a waterproof resin on both sides, which prevents processing chemicals from penetrating the paper base. Therefore, processing and washing times are much shorter.

Graded Papers. You can obtain levels of contrast with these papers by selecting the appropriate grade number. A grade 2 paper is “normal.” For higher contrast, use grade 3, 4, or 5. For lower contrast, use grade 0 or 1. Not all contrast grades are available in all paper types. Graded papers are primarily used in applications such as portraiture, where negative 4 quality and contrast are controlled by standard lighting and processing conditions.

Selective-Contrast Papers. You can control contrast levels with these papers by using filters, such as KODAK POLYMAX Filters*, to alter the blue/green ratio of the exposing light. POLYMAX Filters are available in kits and 90 and 150 mm square sets in grades –1 through 5+ that produce 12 contrast levels ranging from very low to extremely high. In many cases, using these filters with selective-contrast papers will produce contrast ranges much greater than those available with graded papers.

Special-Purpose Papers. To make black-and-white prints from color negatives, you can use KODAK PANALURE SELECT RC Paper or KODAK PROFESSIONAL PORTRA Black & White Paper.

PANALURE SELECT RC Paper is processed in conventional black-and-white chemicals, but KODAK PROFESSIONAL PORTRA Black & White Paper requires KODAK EKTACOLOR Chemicals for Process RA-4. PORTRA Black & White Paper is designed for the convenience of finishers who want to make black-and-white prints without having to maintain a separate black-and-white process.

* 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.**

To Make B/W Positive Slides from B/W Negatives

Start with an Original Image on Any of These KODAK PROFESSIONAL Films	To Produce a Final Image Exposed Onto One of These KODAK PROFESSIONAL Films/Materials	Color Sensitivity*	Process in KODAK Developer†
Continuous-Tone B/W Negative T-MAX 100 PLUS-X 125 TRI-X 320 TRI-X 400 T-MAX 400 T-MAX P3200	**Continuous-Tone Display Positive (contrast depends upon original)**		
	ENDURA Transparency Display Material ENDURA Clear Display Material	Pan	EKTACOLOR Chemicals for Process RA-4
	Fine Grain Positive 7302	Blue	D-76, DEKTOL (depending upon contrast)

To Make B/W Negatives from B/W Prints

Start with a B/W Original Image	To Produce a Final Image Exposed Onto One of These KODAK PROFESSIONAL B/W Films	Color Sensitivity*	Process in KODAK Developer†
Continuous-Tone B/W Print	**Continuous-Tone Copy Negative**		
	T-MAX 100	Pan	T-MAX, T-MAX RS, XTOL, D-76, HC-110

To Make B/W Contrast-Reducing Masks

Start with a B/W Original Image	To Produce a Final Image Exposed Onto One of These KODAK PROFESSIONAL B/W Films	Color Sensitivity*	Process in KODAK Developer†
Contrasty Continuous-Tone B/W Negative	**Contrast-Reducing Printing Mask**		
	T-MAX 100 (all sizes)	Pan	D-76, XTOL
Contrasty Continuous-Tone **B/W Positive**	**Contrast-Reducing Printing Mask**		
	T-MAX 100 (all sizes)	Pan	D-76, XTOL
Color Negative	**Contrast-Reducing Printing Mask**		
	T-MAX 100 (all sizes)	Pan	D-76, XTOL
Color Transparency	**Contrast-Reducing Printing Mask**		
	T-MAX 100 (all sizes)	Pan	D-76, XTOL

To Make B/W Positive Transparencies from B/W Negatives or Prints

Start with a B/W Original Image	To Produce a Final Image Exposed Onto One of These KODAK PROFESSIONAL B/W Films	Color Sensitivity*	Process in KODAK Developer†
Continuous-Tone B/W Print	**Continuous-Tone Positive Transparency**		
	T-MAX 100 (all sizes)	Pan	T-MAX 100 Direct Positive Film Developing Outfit§

***Color-Sensitivity Classifications—**

Blue-sensitive films are sensitive only to ultraviolet radiation and blue light. You can use a safelight with a KODAK Safelight Filter, Nos. OA (greenish yellow), OC (light amber), or 1A (light red) during handling and processing. These safelights provide fairly good light level for darkroom work.

Orthochromatic films are sensitive to ultraviolet radiation and blue and green light. You can use KODAK 1A Safelight Filter (light red) during handling and processing. This filter also permits a fairly good light level in the darkroom.

Panchromatic films are sensitive to all colors of light as well as ultraviolet radiation. They produce gray-tone rendering of subject colors that approximate their visual brightness, and can provide a variety of gray-tone renderings when you expose them with filters. No safelight is recommended, although you can use a green KODAK 3 Safelight Filter (dark green) with black-and-white filmsother than KODAK PROFESSIONAL T-MAX Films for a few seconds during processing. This safelight transmits only enough light to determine contours, not detail.

Extended red films are panchromatic films with extended red sensitivity. Do not use a safelight; handle these films in total darkness.

†**Note:** This list includes the Kodak developers most commonly used for processing these films or papers. See the developer, film, or paper instructions for processing and special agitation procedures.

§KODAK T-MAX 100 Direct Positive Film Developing Outfit is for producing continuous-tone positive black-and-white slides from KODAK PROFESSIONAL T-MAX 100 Film.

To Make B/W Reflection Prints from B/W or Color Negatives

Original Image	Finished Print on KODAK PROFESSIONAL Paper	Process in KODAK Developer
Continuous-Tone B/W Negative	**Graded Fiber-Base Print**	
	Contact Printing Paper: AZO	DEKTOL, POLYMAX T
	Graded RC Print	
	KODABROME II RC	DEKTOL, POLYMAX T
	Selective-Contrast RC Print	
	POLYCONTRAST IV	DEKTOL, POLYMAX T
	Selective-Contrast Fiber-Base Print	
	POLYMAX Fine-Art	DEKTOL, POLYMAX T
Continuous-Tone Color Negative	**Graded RC Print**	
	PANALURE SELECT RC	DEKTOL, POLYMAX T
	PORTRA Black & White (for Process RA-4)	EKTACOLOR Chemicals for Process RA-4
	PORTRA Sepia Black & White (for Process RA-4)	EKTACOLOR Chemicals for Process RA-4

KODAK PROFESSIONAL Paper	Surface, Paper Weight, Contrast Grades
Fiber Base	
POLYMAX Fine-Art	F-SW, DW N-SW, DW
AZO	F-SW 2

KODAK PROFESSIONAL Paper	Surface, Paper Weight, Contrast Grades
Resin-Coated Base	
POLYCONTRAST IV	F-MW N-MW E-MW D-MW
PANALURE SELECT RC	FM-MW
KODABROME II RC	F-MW 1-4; N-MW 1-4
PORTRA Black & White	F-MW N-MW E-MW
PORTRA Sepia	E-MW

Surface (texture and sheen)

D—Smooth, fine lustre
E—Fine-grained, lustre
F—Smooth, glossy
N—Smooth, semi-matt

Base Weight

SW—Single weight
DW—Double weight
MW—Medium weight

KEY—

Continuous Tone An image that exhibits a smooth gradation of tones or shades of gray from light to dark. Continuous-tone images may be positive or negative, or have high or low contrast.

Contrast The difference in brightness between the lightest and darkest tones of an image or scene. Images or scenes that exhibit very light to very dark tones with few intermediate tones are called “high contrast.” “Low contrast” images are usually characterized by a short range of tones—such as middle gray to dark gray, without any black or white.

Copy Negative A negative made from a positive print or transparency, for the purpose of making additional prints by conventional photographic means. Can also be used to correct defects or adjust the contrast of an original image to make subsequent printing easier, such as when hundreds of prints must be made from a negative that is difficult to print.

Duplicate Negative A negative made from a negative that matches or enhances the contrast and characteristics of the original as closely as possible. Often made when an original is too valuable to be subjected to frequent handling. Usually made from direct-positive materials or by the ‘interpositive” method.

Internegative Usually a copy negative made from a transparency or color print.

Interpositive A specific type of transparency, or film positive, that is the first step in a two-step negative duplication. A negative is “printed” onto a negative-working film that reverses the tonal values. The resulting film positive is then “printed” onto negative film, which restores the tonal relationships of the original negative. Requires rigorous control to maintain the exact contrast of the original through the steps.

Line or Line Copy An image exhibiting only solid blocks or lines of tone with no tonal gradations, such as text on a page. These images may be positive or negative, and usually have very high contrast.

Mask An intermediate image made from a negative or transparency for the purpose of altering the characteristics of a negative or transparency. Once made, the mask is sandwiched “in register” with the negative or transparency to increase or reduce contrast.

Negative A developed photographic image in which the tonal relationships of the original scene are reversed—light tones are recorded as dark and dark tones as light. The “negative” is then “printed” to restore a normal, or positive image.

Negative Working A photographic material that reverses the tones in an image. Conventional photographic materials are negative working because light-sensitive compounds usually darken or increase in visual density with increasing exposure to light. Therefore, a negative-working camera film reverses the tones of the original scene, and a companion negative-working print material reverses the tones again, back to their “normal” or positive relationship.

Positive A photographic image with similar light-to-dark tonal values as those in the original scene. The ultimate result of the photographic process is usually a positive image. If it is on paper or similar opaque support, it’s commonly called a “print.” If the positive image is on a clear support, such as glass or film, it’s commonly called a “transparency” or “slide.”

Positive Working A photographic material that retains the tonal value of the original scene (rather than reversing them). Light areas in the original create light areas in the camera film, etc. Also called “direct positive” because it does not require a separate printing (interpositive) step as negative-working films do.

Print In photography, a print is usually a positive image on an opaque support, such as fiber-base or resin-coated paper. The image is viewed by reflecting light from the print surface.

Transparency A positive image on a transparent or translucent support, such as film. Viewed by directing light through the support. Also called “film positive.”

MORE INFORMATION

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

More information on KODAK PROFESSIONAL Black-and-White Films and Papers is available on the Kodak website or contact Kodak in your country.

Black-and-White Films

E103BF	*KODAK PROFESSIONAL Black-and-White Films*
F-13	*KODAK High Speed Infrared Film*
F-4016	*KODAK PROFESSIONAL T-MAX Films*
F-4017	*KODAK PROFESSIONAL TRI-X 320 and 400 Films*
F-4018	*KODAK PROFESSIONAL PLUS-X 125 Film*

Black-and-White Chemicals

E103CF	*Chemicals for KODAK PROFESSIONAL Black-and-White Films*
E103CP	*Chemicals for KODAK PROFESSIONAL Black-and-White Papers*
J-5	*KODAK POLYMAX T Developer and KODAK POLYMAX T Fixer*
J-24	*KODAK HC-110 Developer*
J-78	*KODAK Developer D-76*
J-85	*KODAK POLYMAX RT Chemicals*
J-86	*KODAK T-MAX Developers*
J-87	*KODAK T-MAX 100 Direct Positive Film Developing Outfit*
J-109	*KODAK XTOL Developer*

Black-and-White Papers

E103BP	*KODAK PROFESSIONAL Black-and-White Papers*
G-10	*KODAK AZO Paper*
G-16	*KODAK PROFESSIONAL KODABROME II RC Paper*
G-23	*Toning KODAK Black-and-White Materials*
G-24	*KODAK POLYMAX Fine-Art Paper*
G-4037	*KODAK POLYCONTRAST IV RC Paper*

Reference and Techniques

E-30	*Storage and Care of KODAK Photographic Materials—Before and After Processing*
F-3	*Code Notches for KODAK Sheet Films*
F-33	*KODAK PROFESSIONAL Black-and-White Films, Papers, and Chemicals*
J-2A	*Health, Safety, and Environmental Emergency Card*
J-4	*Safe Handling of Photographic Chemicals*
J-4S	*The Prevention of Contact Dermatitis in Photographic Work*
K-4	*How Safe Is Your Safelight?*

Process Monitoring

Z-133E	*Monitoring and Troubleshooting KODAK Black-and-White Film Processes*

For the latest version of technical support publications for KODAK PROFESSIONAL Products, visit Kodak on-line at:
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 are available from dealers who supply KODAK PROFESSIONAL Products. You can use other materials, but you may not obtain similar results.

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