



# Black & White + 400

FILM



## INTRODUCING... THE POWER AND CREATIVITY OF BLACK AND WHITE WITH THE CONVENIENCE OF COLOR.

KODAK Black & White + 400 Film is the most recent addition to the KODAK SELECT Series of films. This series offers a wide selection of high-performance films specially tailored to the expectations and needs of dedicated photo enthusiasts.

Black-and-white photography is enjoying a revival as a creative medium for serious and aspiring snapshooters and photo enthusiasts. Black-and-white film is superb at capturing patterns and contrast, textures and forms, and a world of tonal relationships from dramatic to subtle. Now with KODAK Black & White + 400 Film, you can enjoy the elegance and emotion of black and white with the ease, speed, and consistency of color negative film and processing.

How does it work? This revolutionary "chromogenic" film incorporates Kodak's latest color negative emulsion technology. The emulsion layers contain a combination of dye couplers balanced to produce a neutral gray or black when printed on color negative papers. Because the film is made from color negative film emulsions, you can have it processed and printed by the same photofinisher that processes your color print film. After processing, the lab will print the negatives on a color negative paper such as KODAK EKTACOLOR Edge 7 Paper.

For dramatic and creative effects, a custom photoprocessing lab can print your negatives to provide different hues, such as sepia, blue, cranberry, etc., creating prints that resemble traditional black-and-white prints treated with toners. You can also print the negatives on traditional black-and-white papers.

In addition to its convenience in processing and printing, KODAK Black & White + 400 Film offers a great deal of versatility during shooting. With its high speed of EI 400 and wide exposure latitude, you can easily capture images under a wide variety of lighting conditions from bright daylight to low light. It's ideal for capturing fast action, for use with zoom lenses, and for extending your flash range.

The outstanding grain and sharpness make this film ideal for dramatic enlargements.

KODAK Black & White + 400 Film lets your experience the world of black-and-white photography with all the convenience of color. It's a whole new way to add black and white to your creative repertoire!

FEATURES	BENEFITS
<ul style="list-style-type: none"> <li>Chromogenic black-and-white film for Process C-41</li> </ul>	<ul style="list-style-type: none"> <li>Easy processing at your usual photoprocessing lab</li> <li>Convenient printing on color paper</li> </ul>
<ul style="list-style-type: none"> <li>High-quality, neutral-tone prints</li> </ul>	<ul style="list-style-type: none"> <li>A new way to explore your creative potential</li> </ul>
<ul style="list-style-type: none"> <li>High speed at EI 400</li> </ul>	<ul style="list-style-type: none"> <li>Ideal for all-around use</li> <li>Stops action</li> <li>Excellent for use under lighting conditions from bright sunlight to dim existing light</li> </ul>
<ul style="list-style-type: none"> <li>Excellent image structure</li> <li>KODAK T-GRAIN® Emulsions for extremely fine grain and high sharpness</li> </ul>	<ul style="list-style-type: none"> <li>Outstanding enlargements</li> <li>Excellent rendering of fine detail</li> </ul>
<ul style="list-style-type: none"> <li>Wide exposure latitude from 2 stops underexposure to 3 stops overexposure when exposed at EI 400</li> </ul>	<ul style="list-style-type: none"> <li>Better results under most lighting conditions</li> <li>Greater forgiveness of exposure errors</li> <li>High-quality prints with good shadow detail, even with underexposure</li> </ul>
<ul style="list-style-type: none"> <li>Image-tone options</li> </ul>	<ul style="list-style-type: none"> <li>A variety of tones (sepia, blue, cranberry, etc.) available through some photofinishers</li> </ul>
<ul style="list-style-type: none"> <li>Translucent film can</li> <li>Writable surface on magazine and lid canister</li> </ul>	<ul style="list-style-type: none"> <li>Easy film identification</li> <li>Space for notes and exposure information</li> </ul>

**Important.** This film must be processed in KODAK FLEXICOLOR Chemicals, Process C-41, or compatible chemicals. It *cannot* be processed in conventional black-and-white chemicals.

## Film Selector

Kodak has a variety of SELECT Series Films to suit your particular applications. Choose with confidence from a variety of films: For black-and-white photography, we offer KODAK Black & White + 400 Film. For color slides, try KODACHROME or KODAK ELITE Chrome Films. For color prints, select KODAK ROYAL GOLD Films. (For a complete list of these films, see the Film Selector table at the end.)

## SIZE AVAILABLE

Sizes and catalog numbers may vary from country to country. See your dealer in Kodak products.

## STORAGE AND HANDLING

Load and unload your camera in subdued light.

High temperature or high humidity may produce unwanted quality changes. Store *unexposed* film at 70°F (21°C) or lower in the original package. Always store film (exposed or unexposed) in a cool, dry place. For best results, process film as soon as possible after exposure.

Protect *processed* film from strong light, and store it in a cool, dry place. For more information on storing negatives, see KODAK Publication No. E-30, *Storage and Care of Photographic Materials—Before and After Processing*

## DARKROOM RECOMMENDATIONS

Do *not* use a safelight. Handle unprocessed film in *total darkness*.

**Important.** This film cannot be processed in conventional black-and-white chemicals. It must be processed in KODAK FLEXICOLOR Chemicals, Process C-41, or compatible chemicals. See "PROCESSING."

## EXPOSURE

### Film Speed—Automatic Cameras

In automatic cameras, the film speed is set automatically when film is loaded into the camera.

### Film Speed—Manual Cameras

Some cameras allow manual adjustments (marked for ISO, ASA, or DIN speeds or exposure indexes). Film specially sensitized to yield excellent black-and-white pictures when exposed under a variety of illuminants and lighting conditions.

Do not change the film-speed setting when you use a filter if your camera has through-the-lens metering.

## Daylight

Use the exposures in the table below for average frontlit subjects from 2 hours after sunrise to 2 hours before sunset.

Lighting Conditions	Shutter Speed (second)	Lens Opening
Bright or Hazy Sun on Light Sand or Snow	1/500	f/16
Bright or Hazy Sun (Distinct Shadows)	1/500	f/11*
Weak, Hazy Sun (Soft Shadows)	1/500	f/8
Cloudy Bright (No shadows)	1/500	f/5.6
Heavy Overcast or Open Shade†	1/500	f/4

\* Use f/5.6 for backlit close-up subjects.

† Subjects shaded from the sun but lighted by a large area of clear sky.

## Existing Light

Subject and Lighting Conditions	Shutter Speed (second)	Lens Opening
Home Interiors at Night —Average Light —Bright Light	1/30 1/30	f/2 f/2.8
Fireworks —Aerial Displays* —Displays on Ground	"Bulb" or "Time"† 1/60	f/16 f/4
Interiors with Bright Fluorescent Light	1/60‡	f/4
Brightly Lit Street Scenes at Night	1/60	f/2.8
Neon and Other Lighted Signs	1/125	f/4
Floodlighted Buildings, Fountains, Monuments	1/15†	f/2
Night Football, Soccer, Baseball, Racetracks	1/125	f/2.8
Basketball, Hockey, Bowling	1/125	f/2
Stage Shows —Average Light —Bright Light	1/60 1/250	f/2.8
Circuses and Ice Shows —Floodlighted Acts —Spotlighted Acts	1/125 1/250	f/2.8
School—Stage and Auditorium	1/30	f/2

\* Leave shutter open for several bursts.

† Use a tripod or other firm camera support for exposure times longer than 1/30 second.

‡ Use shutter speeds of 1/60 second or longer with fluorescent light.

## Electronic Flash

If your camera features a dedicated automatic flash, you will not need to make any additional settings. If your flash equipment requires you to set the film speed, use ISO 400/27, and refer to the camera instructions. Whenever possible, it's a good idea to use a flash—even outdoors. In daylight, flash can lighten facial shadows and brighten dark shadows. Flash can also be useful for action photography to stop the action.

## Adjustments for Long and Short Exposures

You do not need to make any exposure adjustments for exposure times of 1/10,000 second to 120 seconds. For exposures longer than 120 seconds, you will need to make tests.

## Filters

If your camera will allow you to place a filter over the lens, you can use the same effect-enhancing filters used for conventional black-and-white films with very similar results. For example, use a yellow or red filter to darken a blue sky and emphasize clouds, or use a green filter to accentuate red lips in a portrait. Since filters absorb some light that would otherwise reach the film, the exposure must be adjusted according to the filter you use.

Consult your camera manual for instructions on using filter. Many cameras make light meter readings through the filter, and adjust the exposure accordingly. If your camera does not automatically adjust the exposure when the filter is placed on the lens, adjust your exposure manually according to the table below.

KODAK WRATTEN Gelatin Filter	Daylight		Tungsten	
	Open Lens Aperture By (f-stops)	OR Multiply Exposure By (Filter Factor)	Open Lens Aperture By (f-stops)	OR Multiply Exposure By (Filter Factor)
No. 8 (yellow)	$\frac{2}{3}$	1.4	$\frac{1}{3}$	1.25
No. 11 (yellowish green)	$1\frac{2}{3}$	3	$1\frac{2}{3}$	3
No. 15 (deep yellow)	1	2	$\frac{2}{3}$	1.4
No. 25 (red)	3	8	$1\frac{2}{3}$	3
No. 47 (blue)	$3\frac{2}{3}$	12.5	4	16
No. 58 (green)	$2\frac{1}{2}$	5.6	2	4
Polarizing Filter*	$1\frac{1}{3}$	2.5	$1\frac{1}{3}$	2.5

\* Average filter factor, which may vary slightly depending on the manufacturer. Polarizing filters are not manufactured by Kodak.

## PROCESSING

Process KODAK Black & White + 400 Film in KODAK FLEXICOLOR Chemicals for Process C-41. You can have this film processed by any photofinisher who processes color negative films such as KODAK GOLD or VERICOLOR III Professional Film. Black & White + 400 Film is fully compatible with Process C-41, and can be intermixed with color negative films during processing in all equipment, from minilabs to high-volume continuous, roller-transport, or rack-and-tank processors.

You can also use KODAK FLEXICOLOR Chemicals in the 1-gallon size to process this film in a small tank or a rotary-tube processor.

For specifications on Process C-41, see KODAK Publication No. Z-131, *Using KODAK FLEXICOLOR Chemicals*.

**Note:** Do not process this film in conventional black-and-white chemicals.

## PUSH PROCESSING

Black & White + 400 Film can be rated at higher than normal exposure indexes for photography in dim light or where fast shutter speeds must be maintained. Push processing in Process C-41 results in acceptable negatives from exposure indexes as high as 3200.

Exposure Index	Approximate Developer Time in Process C-41
400 to 800	3:15
1600	3:45
3200	4:15

**Note:** Not all processing equipment can be used for push processing, and many photofinishers do not offer this service. Check with your lab or photofinisher before rating this film higher than EI 1600.

## RETOUCHING

Treat the negative as if it were a color negative. You can retouch the 135-size film on the emulsion side only.

Both retouching dye and black graphite lead pencil can be used to retouch this film. When retouching with a pencil on the emulsion side, use KODAK Retouching Fluid to improve the tooth of the film.

## PRINTING NEGATIVES

### Printing on Color Papers and Display Materials

Black & White + 400 Film is designed to deliver excellent black-and-white prints on either color or black-and-white photographic papers. When printing on color papers, you can also create special-effect tones, such as sepia, simply by changing the printer color balance.

KODAK Black & White + 400 Printer Balancing Kit is available to help photofinishers optimize a printer channel to print this film on KODAK PROFESSIONAL PORTRA, SUPRA, EKTACOLOR Edge 7, or EKTACOLOR ROYAL VII Papers, so that it can be printed along with color negative films. This means you can receive high-quality black-and-white prints in the same amount of time as it takes your finisher to process and print a roll of color film.

You can also make black-and-white prints from Black & White + 400 Film negatives by enlarging them on PORTRA III and SUPRA II Papers or KODAK DURAFLEX® RA Print Material.

You can make black-and-white transparencies by direct exposure onto KODAK DURATRANS® RA or DURACLEAR® RA Display Materials, or VERICOLOR Slide or VERICOLOR Print Films.

When working with a color enlarger to print on KODAK PROFESSIONAL Papers and DURAFLEX or DURACLEAR Print Materials, use a starting filter pack of 70M and 75Y, and make filter adjustments to balance the print to a desired tone.

**Note:** Occasionally, the image tone of prints may vary slightly from neutral because of differences in printer setups. The tones of your prints can range from a cool, bluish black to a warm brown or olive black depending on the finisher. This subtlety will add an extra dimension to your images.

### Printing on KODAK EKTAMAX RA Professional Paper

You can make black-and-white prints by enlarging them on KODAK EKTAMAX RA Professional Papers for Process RA-4. EKTAMAX RA Professional Papers are intended for interim use, such as school picture proofing, and are not recommended where long-term print keeping is desired.

### Printing on Black-and-White Papers

You can make black-and-white prints by enlarging them as you would any other black-and-white negative. You can use a graded paper, such as KODABROME II RC, or selective-contrast papers, such as KODAK POLYCONTRAST III RC or POLYMAX Fine-Art Papers.

If you print on graded black-and-white papers, a normal exposure on this film will print well at grade 3.

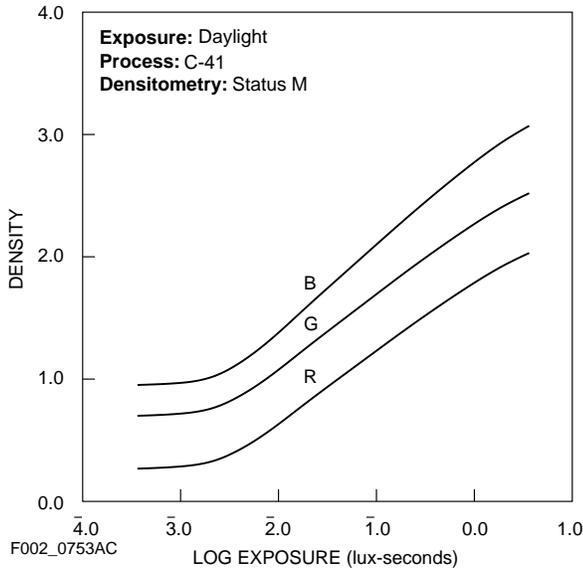
When printing on selective-contrast papers with KODAK POLYMAX II Filters, a normally exposed negative will print well with a 3 or 3 1/2 filter. The light brown to orange color of the Black & White + 400 Film base *does not* affect contrast control with POLYMAX II Filters.

# KODAK BLACK & WHITE + 400 FILM

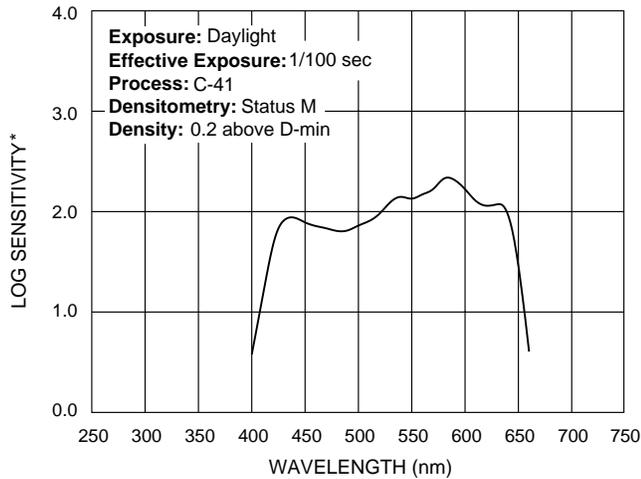
Image Structure

Sharpness:	Very high
Enlargement:	Very high

## Characteristic Curves



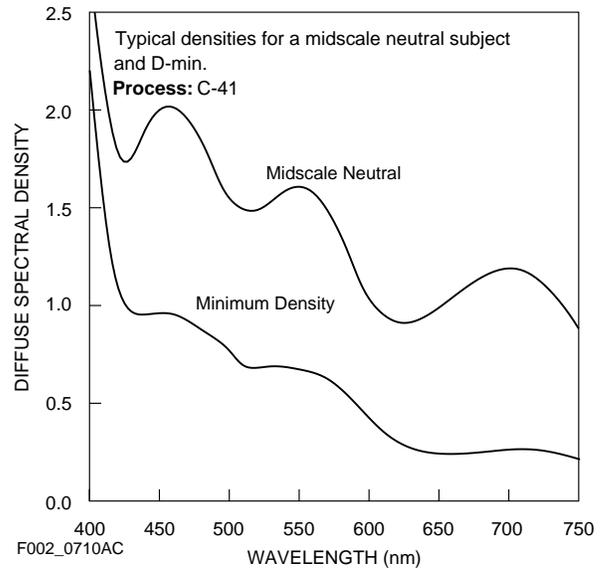
## Spectral-Sensitivity Curves



\*Sensitivity = reciprocal of exposure (ergs/cm<sup>2</sup>) required to produce specified density

F002\_0709AC

## Spectral-Dye-Density Curves



**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.

# KODAK Black & White + 400 Film

## MORE INFORMATION

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

Additional information is available on the Kodak website and through the U.S.A./Canada faxback system.

### Kodak Information Center's Faxback System

—Available 24 hours a day, 7 days a week—

Many technical support publications for Kodak products can be sent to your fax machine from the Kodak Information Center. Call:

**U.S.A. 1-800-242-2424, Ext. 33**  
**Canada 1-800-295-5531**

*If you have questions about Kodak products, call Kodak.*

*In the U.S.A.:*

*1-800-242-2424, Ext 25, Monday–Friday  
9 a.m.–7 p.m. (Eastern time)*

*In Canada:*

*1-800-465-6325, Monday–Friday  
8:30 a.m.–5 p.m. (Eastern time)*

*Or contact Kodak on-line at:  
<http://www.kodak.com>*

## AT-A-GLANCE FILM SELECTOR

KODAK SELECT Series Film	Film Speed	Exposure	Lighting Conditions	Grain	Sharpness	Process
<i>For Black-and-White Prints</i>						
Black & White + 400	ISO 400	Daylight or Electronic Flash	Bright daylight to low light	Very fine	Very high	C-41
<i>For Color Prints</i>						
ROYAL GOLD 100	ISO 100	Daylight or Electronic Flash	Bright or hazy sun Enlargements	Micro-fine	Extremely high	C-41
ROYAL GOLD 200	ISO 200		Weak or hazy sun Enlargements	Very fine	Extremely high	C-41
ROYAL GOLD 400	ISO 400		Cloudy Bright, Indoors, Low light	Very fine	Very high	C-41
ROYAL GOLD 1000	ISO 1000		Low light, Indoors, Fast action	Moderate	High	C-41
<i>For Color Slides</i>						
ELITE Chrome 100	EI 100	Daylight or Electronic Flash	Bright or hazy sun Enlargements	Extremely fine	—	E-6
ELITE Chrome 160T (Tungsten)	EI 160	Tungsten	Stadium, Theater, Indoors	Very fine	—	E-6
ELITE Chrome 200	EI 200	Daylight or Electronic Flash	Multi-purpose use	Extremely fine	—	E-6
ELITE Chrome 400	EI 400	Daylight or Electronic Flash	Low light, Fast action	Fine	—	E-6
KODACHROME 25	EI 25	Daylight or Electronic Flash	Bright or hazy sun Enlargements	Extremely fine	—	K-14
KODACHROME 64	EI 64	Daylight or Electronic Flash	Multi-purpose use	Extremely fine	—	K-14
KODACHROME 200	EI 200	Daylight or Electronic Flash	Low light, Fast action	Fine	—	K-14

Consumer Imaging  
**EASTMAN KODAK COMPANY • ROCHESTER, NY 14650**