

# KODAK Black & White Film



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

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 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 EDGE Generations 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 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 Film lets you 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> <li>High speed at EI 400</li> </ul>	<ul style="list-style-type: none"> <li>A new way to explore your creative potential</li> <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.

### SAFELIGHT

Handle unprocessed film in total darkness.

Process this film in total darkness through the bleach step in Process C-41.

Do not use a safelight.

## 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*.

## 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 Exposure:

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

Lighting Conditions	Shutter Speed (seconds)	Lens Opening
Bright/Hazy Sun on Light Sand or Snow	1/500	f/16
Bright or Hazy Sun, Distinct Shadows	1/500	f/11 <sup>1</sup>
Weak, Hazy Sun, Soft Shadows	1/500	f/8
Cloudy Bright, No Shadows	1/500	f/5.6
Heavy Overcast, Open Shade <sup>2</sup>	1/500	f/4

<sup>1</sup> Use f/5.6 for backlighted close-up subjects.

<sup>2</sup> Subject shaded from the sun but lighted by a large area of 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 <sup>1</sup> —Displays on Ground	"Bulb" or "Time" <sup>2</sup> 1/60	f/16 f/4
Interiors with Bright Fluorescent Light	1/60 <sup>3</sup>	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 <sup>2</sup>	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 f/2.8
Circuses and Ice Shows —Floodlighted Acts —Spotlighted Acts	1/125 1/250	f/2.8 f/2.8
School —Stage and Auditorium	1/30	f/2

<sup>1</sup>Leave shutter open for several bursts.

<sup>2</sup>Use a tripod or other firm camera support for exposure times longer than 1/30 second.

<sup>3</sup>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.

## Using Filters

If your camera will allow you to place filters over the lens, you can use the same effect-enhancing filters used on conventional black-and-white films, with the same results. For example, you can use a yellow or red filter to darken blue sky for dramatic cloud effects, or a green filter to lighten foliage in a scenic composition, or 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 being used.

Consult your camera manual for instructions on using filters. Many cameras make light meter readings right through the filter, and automatically 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)	Multiply Exposure By (filter factor)	Open Lens Aperture By (f-stops)	Multiply Exposure By (filter factor)
No. 8 (yellow)	2/3	1.4	1/3	1.25
No. 11 (yellowish green)	1 2/3	3	1 2/3	3
No. 15 (deep yellow)	1	2	2/3	1.4
No. 25 (red)	3	8	1 2/3	3
No. 47 (blue)	3 2/3	12.5	4	16
No. 58 (green)	2 1/2	5.6	2	4
Polarizing Filter <sup>1</sup>	1 1/3	2.5	1 1/3	2.5

<sup>1</sup>Average filter factor, which may vary slightly depending on the manufacturer. Eastman Kodak Company does not manufacture polarizing filters.

**Note:** Do not change the film speed setting when metering through a filter. Metering through filters may affect light meter accuracy; see the meter manual (or camera manual for built-in meters) for specific information.

## PROCESSING

Process KODAK Black & White Film in KODAK FLEXICOLOR Chemicals for Process C-41. You can have this film processed by any photofinisher who processes color negative films. 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. KODAK Prints from this film will be monochromatic (black-and-white). Since this film uses color film technology, and is printed on color print paper, prints

may be slightly cool-black, neutral, or slightly warm-black, depending on the particular lab's printing preference.

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.

Because KODAK Black & White Film uses color film technology, you can choose almost any color you want your prints to be, such as sepia for an old-time look, denim blue, even cranberry red. You do not have to choose when you have the film developed. If you have preferences, discuss them with your photofinisher / processing lab representatives.

## Push Processing

Black & White 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 Material

This film is optimized for printing on KODAK EDGE Generations, KODAK EKTACOLOR EDGE 8, KODAK ROYAL Generations, KODAK EKTACOLOR ROYAL VIII, KODAK EKTACOLOR EDGE 9 AP, and KODAK EKTACOLOR ROYAL IX AP, and KODAK PROFESSIONAL ENDURA Metallic Papers. The film can also be printed on KODAK EKTACOLOR EDGE 7 Paper. Starting recommendations for KODAK EKTACOLOR EDGE 8 Paper are available online at [www.kodak.com/go/photofinishing](http://www.kodak.com/go/photofinishing).

Make color slides and transparencies by printing the negatives on KODAK VERICOLOR Slide Film, KODAK PROFESSIONAL ENDURA Transparency Optical Display Material, or KODAK PROFESSIONAL ENDURA Clear Optical Display Material.

You can scan an image to a file and print digitally to KODAK PROFESSIONAL ULTRA ENDURA Paper, KODAK PROFESSIONAL ENDURA Metallic Paper, KODAK PROFESSIONAL ENDURA Transparency Digital Display Material, KODAK PROFESSIONAL ENDURA Clear Digital Display Material, and KODAK PROFESSIONAL DURAFLEX® Plus Digital Display Material.

Make black-and-white prints on KODAK PANALURE SELECT RC Papers for conventional black-and-white processing or on KODAK PROFESSIONAL PORTRA Black & White Paper for Process RA-4.

When working with a color enlarger to print on KODAK PROFESSIONAL Papers and ENDURA 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.

### JUDGING NEGATIVE EXPOSURES

Expose this film properly for optimum results.

Check the exposure level of the color negative with a suitable electronic densitometer equipped with a filter such as the red filter for Status M Densitometry, or a KODAK WRATTEN Gelatin Filter No. 92. Depending on the subject and the light source used for exposure, a normally exposed color negative measured through the red filter should have the approximate densities listed below. These densities apply for the recommended light sources and correct processing of the negative.

### Densities of Properly Exposed and Processed Negatives:

Area on the Negative:	Densities:
The KODAK Gray Card <sup>1</sup> (gray side) receiving the same illumination as the subject	0.80 to 1.00
The lightest step (darkest in the negative) of a KODAK Paper Gray Scale receiving the same illumination as the subject	1.15 to 1.35
Normally lighted forehead of person with light complexion <sup>2</sup>	1.05 to 1.35
Normally lighted forehead of person with dark complexion <sup>2</sup>	0.90 to 1.20

<sup>1</sup>KODAK Publication No. R-27

<sup>2</sup>Because of the extreme range in skin color, use these values only as a guide. For best results, use a KODAK Gray Card (gray side).

## IMAGE STRUCTURE

### Print Grain Index Magnification Table:

Print Grain Index numbers for diffuse printing illumination.

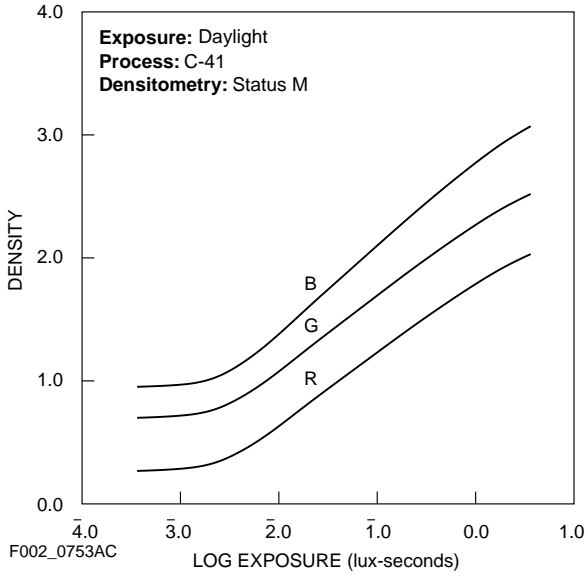
Negative Size: 24 x 36 mm; 135 format or 35 mm Roll Film

Print Size in inches:	4x6	8x10	16x20
Print Size in centimeters:	10.2x15.2	20.3x25.4	40.6x50.8
Magnification:	4.4X	8.8X	17.8X
Print Grain Index number:	< 25	40	70

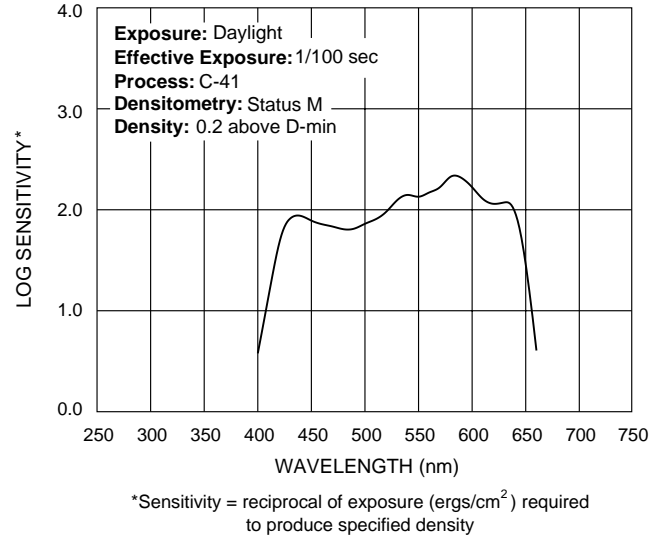
- This is a method which replaces rms granularity. It is on a different scale, which cannot be compared to rms granularity.
- The scale is a uniform perceptual scale, with a change of 4 units representing a Just Noticeable Difference for 90% of observers.
- Index value representing the approximate visual threshold for graininess: 25.
- Standardized inspection distance for all print sizes: 35.6 cm (14 inches).
- In practice, prints larger than 10.2 x 15.2 cm (4x6 inches) will likely be viewed from distances greater than 35.6 cm (14 inches), thereby reducing overall graininess that is perceived.
- These Grain Index numbers may not represent graininess observed from more specular printing illuminants, such as condenser enlargers.

# CURVES

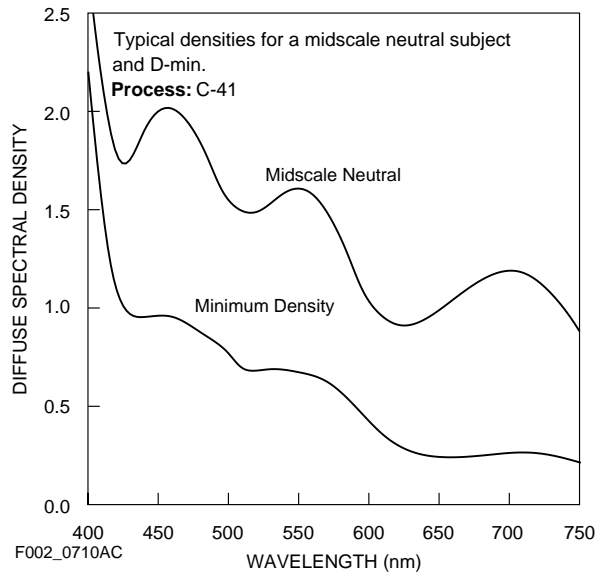
## Characteristic Curves



## Spectral-Sensitivity Curves



## 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 Film

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## MORE INFORMATION

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

Additional is available on the Kodak website at [www.kodak.com](http://www.kodak.com).

For the latest version of technical support publications for KODAK Products, visit Kodak on-line at: <b><a href="http://www.kodak.com">http://www.kodak.com</a></b>
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If you have questions about KODAK Products, call Kodak.
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In the U.S.A.:
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1-800-242-2424, Monday–Friday
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9 a.m.–7 p.m. (Eastern time)
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In Canada:
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1-800-465-6325, Monday–Friday
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