KODAK Professional Copy Film

DESCRIPTION

KODAK Professional Copy Film is an orthochromatic film (sensitive to blue and green light and ultraviolet radiation) designed for copying continuous-tone originals. You can use a safelight with a red filter when you handle and process this film.

This special-purpose film works differently than other black-and-white films. Generally, the contrast of negatives is controlled by development. However, with this film, contrast in the copy negative is controlled by both exposure and development.

FEATURES	BENEFITS
• Fine grain, medium resolving power	• Good rendition of detail
• Increased highlight contrast	• Avoids the flat look typically associated with camera films; retains highlight tones of the original • Highlight contrast largely controlled by exposure

SIZES AVAILABLE

Sheets Per Package	Sizes (inches)	Film Code	Base	CAT No.
25	4 x 5	[redacted]	7-mil ESTAR Thick	171 4062
100	4 x 5			171 4104
100	5 x 7			171 4161
50	8 x 10			171 4260
25	10 x 12			171 4286
25	11 x 14			171 4302
25	20 x 24			171 4385

STORAGE AND HANDLING

Handle unprocessed film under a safelight lamp with a KODAK 2 Safelight Filter (dark red) with a 15-watt bulb. Keep the safelight at least 4 feet (1.2 metres) from the film.

High temperatures or high humidity may produce unwanted quality changes. Store unexposed film at 24˚C (75˚F) 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

Speed

Daylight: ISO 12/12˚

Pulsed-Xenon Arc: EI 15/15˚

Use the setting for tungsten illumination with exposure meters marked for ISO, ASA, or DIN speeds or exposure indexes for trial exposures. It applies to incident-light meters directly and to reflected-light meter readings of a KODAK Gray Card at the copyboard. If you use a matte white card, multiply the calculated exposure time by 5.

The pulsed-xeon arc value indicates the speed of this film to pulsed-xenon illumination measured with a light integrator.

With most black-and-white films, the contrast of negatives is controlled by development. However, with KODAK Professional Copy Film, contrast in the copy negative is controlled by both exposure and development.

Development controls the contrast of the midtone and shadow regions of the negative (and to a slight extent, the highlight region), while exposure primarily controls the contrast of the highlight. For a given development condition, as the exposure increases, highlight density increases at a faster rate than shadow density, increasing the overall contrast.

Adjust both the exposure and development times to meet the contrast requirements for a particular application. To adjust overall contrast, change either the development time or the exposure. You'll obtain the best tonal rendition when you standardize the process (development time) to give proper contrast to the shadow and midtone areas, and place the highlights by varying exposure.

To determine the correct exposure and development time for a given application, use the following procedure:

1. Select an original that has a contrast range typical of originals to be copied. The original should have a few large representative light, medium, and dark tones.
2. Determine an initial setting for a trial exposure based on film speeds and lighting noted above.
3. Expose five sheets of film to the selected original using the trail exposure setting. Process one sheet according to starting-point recommendations. Process one sheet for 10 percent less development time than the recommendation, another for 20 percent less, another for 10 percent more, and the last for 20 percent more.
4. Print your negatives. Select the print that gives the best midtone and dark-tone contrast. The development time used to process the negative that produced this print will be the standard time to use for work of this type.
5. Expose several sheets of film using a range of exposures from 50 percent less to 50 percent more than the trial exposure. Process these sheets for the development time determined in Step 4. Varying the exposure change the ratio of tones recorded on the two portions of the characteristic curves. Negatives with less exposure will have more midtones recorded with normal contrast and fewer of the light tones and highlights recorded with increased contrast. Negatives with more exposure will have more midtones recorded with higher contrast. For negatives to be printed with diffusion enlargers, a copy negative should have a maximum density of about 1.20, which gives a copy negative density range of about 0.95 for copying a full-scale print.
6. Make prints of each negative and select the print that appears to have the best overall tonal quality. The print you select will determine the basic exposure to use. Once you find an exposure that produces good tone reproduction when the copy negative is printed on normal-grade paper, use the same exposure when copying your continuous-tone originals. Make adjustments for changes in magnification. By giving the same exposure, the highlight tones are consistently placed in the upsweep part of the curve, while the midtones and dark tones are recorded on the lower, straight-line portion of the curve.

Short-scale prints (those not containing a full range of tones) come in two varieties. If the original scene is low contrast, or was printed that way for artistic reasons, the copy negative should receive the same exposure that you'd give a full-scale print. The copy print will then come close to having the same tonal range as the original. If, however, the short-scale print is low in contrast as a result of fading or limitations in the original printing procedure, increase the contrast of the copy print. Increase the exposure you use to make the negative ½ to 1 stop more than that for a full-scale original.

DARKROOM RECOMMENDATIONS

Use a KODAK 2 Safelight Filter (dark red) in a suitable safelight lamp with a 15-watt bulb. Keep the safelight at least 1.2 metres (4 feet) from the film. You can use a KODAK 1 Safelight Filter (red) but only for a short time. Run tests to determine that safelight use will give acceptable results for your application.

For information on safelight testing, see KODAK Publication K-4, *How Safe Is Your Safelight?*

PROCESSING

The development times in the table below are starting-point recommendations. The optimum development time depends on the type of original (continuous-tone, line copy, or a combination of both); the surface, contrast, and tint of the original; the subject matter; camera lens flare, type of enlarger light system (specular or diffuse); the paper you print on; the enlarger or copyboard illumination (tungsten light produces slightly higher contrast than pulsed-xenon light); or a combination of these variables.

Light Source	KODAK Developer	Development Time in Minutes at 20˚C (68˚F)	
		Tray*	Large Tank†
Tungsten	HC-110 (Dil E)	4	5
	DK-50 (1:1)	3 to 3½	3½
Pulsed-Xenon	HC-110 (Dil E)	4	5
	DK-50 (1:1)	3	3½

* With continuous agitation.
† With manual agitation at 1-minute intervals.
Note: In large tanks, developing times of less than 5 minutes may produce unsatisfactory uniformity.

Final Steps in Processing—18 to 24˚C (65 to 75˚F)

KODAK Chemical	Time (min:sec)
Rinse—with agitation:	
KODAK Indicator Stop Bath	0:10 to 0:30
Fix—with frequent agitation:	
KODAK Fixer	5:00 to 10:00
KODAK Rapid Fixer	2:00 to 4:00
KODAFIX Solution	5:00 to 10:00
Wash:	
Running water —OR— Rinse with water KODAK Hypo Clearing Agent Running water	20:00 to 30:00 0:30 1:00 to 2:00 5:00
Final rinse:	
KODAK PHOTO-FLO Solution	0:30
Dry—in a dust-free place	

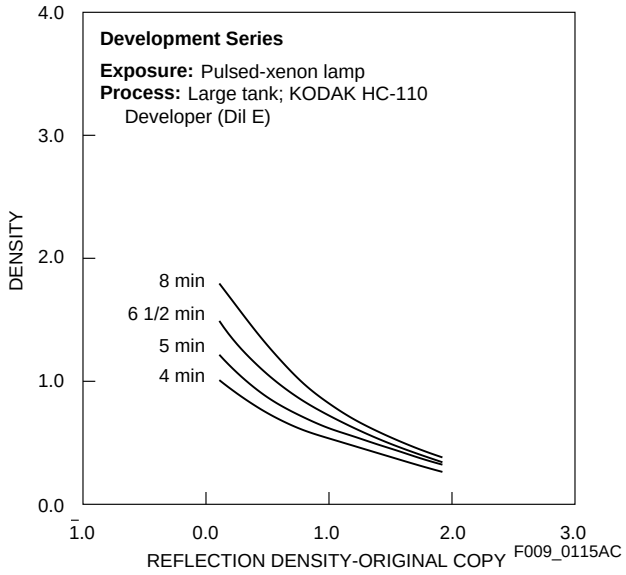
IMAGE-STRUCTURE CHARACTERISTICS

The data in this section is based on development at 20˚C (68˚F) in KODAK HC-110 Developer (Dilution E) for 5 minutes.

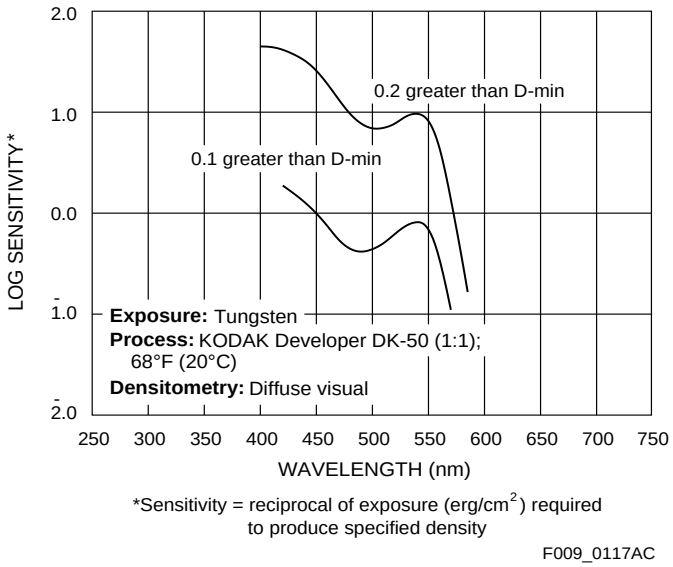
Diffuse rms Granularity* 16 Fine

*Read at a net diffuse density of 1.0, using a 48-micrometre aperture, 12X magnification.

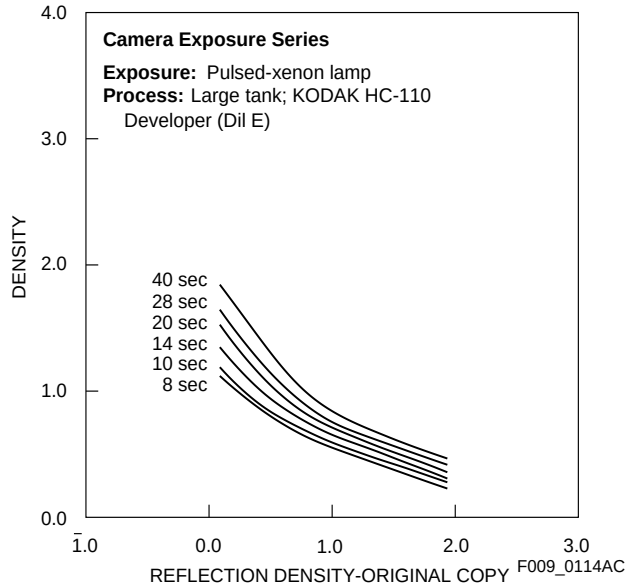
Characteristic Curves



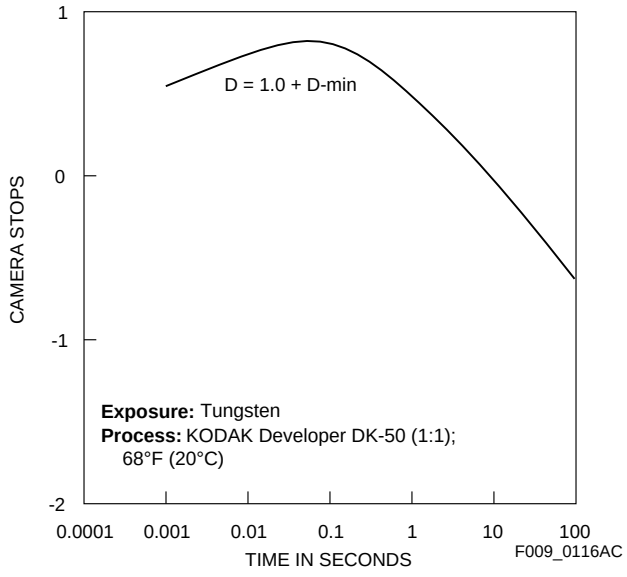
Spectral-Sensitivity Curves



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



Reciprocity Curve



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.

MORE INFORMATION

Kodak has many publications to assist you with information on Kodak products, equipment, and materials. The following publications are available from Kodak through the order form in KODAK Publication No. L-1, *KODAK Index to Photographic Information*. To obtain a copy of L-1, send your request with $1 to Eastman Kodak Company, Department 412-L, Rochester, New York 14650-0532.

E-30	*Storage and Care of KODAK Photographic Materials—Before and After Processing*
E-103BF	*KODAK PROFESSIONAL Black-and-White Films* Matrix
F-2	*Pathways to Black and White*
J-24	*KODAK HC-110 Developer*
K-4	*How Safe Is Your Safelight?*

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Canada: 1-800-295-5531

If you have questions about Kodak products, call Kodak.

In the U.S.A.:
1-800-242-2424, Ext. 19, Monday–Friday
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In Canada:
1-800-465-6325, Monday–Friday
8 a.m.–5 p.m. (Eastern time)

Or contact Kodak on-line at:
http://www.kodak.com/go/professional/

Note: The Kodak materials described in this publication for use with KODAK Professional Copy Film 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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