FILM

Beautiful images and reliable performance

EASTMAN DOUBLE-X Negative Film 5222/7222

Black-and-white negative films from Kodak have been a creative story telling tool for decades. Improved EASTMAN DOUBLE-X Negative Film 5222 / 7222 has the subtleties in tone scale that you've come to expect, and now it's been optimized for physical performance. Improvements include a scratch-resistant backing and a process-surviving top layer, allowing:

- better camera transport
- reduced noise in the camera
- improved raw stock keeping
- decreased risk of ferrotyping

Designed for general production use outdoors and in the studio, in dim light, and anywhere you need greater depth of field without increased illumination. This high-speed camera negative film has excellent image-structure characteristics.

Create your story through light and shadow with a film optimized for beautiful images and reliable performance.

- **BASE** EASTMAN DOUBLE-X Negative Film has a gray acetate safety base. The back side of the base contains an anti-static layer with lubricant.
- **STORAGE** Store unexposed film at 13°C (55°F) or lower. Process exposed film promptly. Store processed film at 21°C (70°F) or lower at a relative humidity of 20 to 30 percent for normal commercial storage. For more information on long-term storage, see KODAK Publications No. H-1, KODAK Motion Picture Film, and No. H-23, The Book of Film Care.
- **DARKROOM RECOMMENDATIONS** Handle unprocessed film in total darkness.
- **EXPOSURE INDEX** (For development to a gamma of 0.65.) Tungsten (3200 K)–200 Daylight–250 Use these indexes with incident- or reflected-light exposure meters and cameras marked for ISO or ASA speeds or exposure indexes. These indexes apply for meter readings of average subjects made from the camera position or for readings made from a gray card of 18-percent reflectance held close to and in front of the subject. For unusually light- or dark-colored subjects, decrease or increase the exposure indicated by the meter accordingly.

IMPROVED PHYSICAL PERFORMANCE

EXPOSURE TABLE FOR TUNGSTEN LIGHT

At 24 frames per second (fps), 170° shutter opening:

Lens Aperture	*f*/1.4	*f*/2	*f*/2.8	*f*/4	*f*/5.6	*f*/8	*f*/11
Footcandles required*	13	25	50	100	200	400	800

* At 18 fps, use 3/4 of the footcandles (fc) shown.

FILTER FACTORS

KODAK WRATTEN Gelatin Filter No.	3	8	12	15	21	23a	25	29	96*
Filter Factor for Daylight	1.5	1.5	2.0	3.0	3.0	5.0	8.0	20	8.0

* For use in bright sunlight to reduce the exposure without modifying color rendering or depth of field. This filter, which has a neutral density of 0.90, provides a reduction exposure equivalent of 3 full stops.

RECIPROCITY

You do not need to make any filter corrections or exposure adjustments for exposure times from 1/10,000 to 1 second.

PROCESSING

Use the following process recommendations as starting points for most conventional continuous-immersion processors with solutions prepared according to the formulas in KODAK Publication No. H-24.15, *Manual for Processing KODAK Motion Picture Films, Module 15*. The processing times may require modification for a particular machine.

Processing Step	Temperature °C (°F)	Time (min:sec)	Replenishment Rate mL per 30.5 metres (mL per 100 ft)	
			35 mm	16 mm
KODAK D-96[1] Developer	21 ± 0.3 (70 ± 0.5)	Approx 7:00[2]	1,250 (D-96R)	625 (D-96R)
Stop Rinse[3]	21 ± 1 (70 ± 2)	0:50	12,000	6,000
KODAK Fixer F-5	21 ± 1 (70 ± 2)	6:00	850	425
Countercurrent Wash	21 ± 1 (70 ± 2)	10:00	12,000	6,000
Dry[4]	35 (95)	—	—	—

[1] Agitation in the developer and fixer should be by recirculation through submerged spray jets that impinge on the film strands.

[2] Develop to recommended control gamma of 0.65 to 0.70 calculated using Status M densitometry (blue).

[3] Fixer-laden water from wash tank, pH about 6.

[4] Drying depends on many factors such as air temperature, humidity, volume and rate of air flow, flow distribution pattern, final squeegeeing, etc.

In a typical convection-type drying cabinet with air at about 35°C (95°F) and 40- to 50-percent relative humidity (RH), satisfactory drying will require 15 to 20 minutes. With an impingement-type drying cabinet, however, with a higher temperature and lower RH, drying time is greatly reduced. With either type of dryer, the film should be dry without tackiness ½ to ⅔ of the way through. After leaving the drying cabinet when it has reached room temperature, the film should be at equilibrium with room air at approximately 50-percent RH.

OTHER PROCESSING PROCEDURES

Rack-and-Tank Equipment

This can be horizontal with the film wound into a flat rack or spiral reel; or vertical with the film wound on racks to fit deep tanks. Solutions and processing steps are given below.

Agitate the rack continuously for the first 5 seconds when it is initially immersed. At 1-minute intervals thereafter, lift the rack completely out of the solution, drain for a few seconds, and reimmerse. With spiral reel-type equipment, use a combination of vertical movement and rotation.

Reel-and-Trough Equipment

This carries the film on a reel or drum which dips into a trough or tray of solution and is rotated continuously during processing. Processing solution/steps are given below.

For agitation, rotate the reel rapidly enough to effect good agitation, but not so rapidly as to splash solution out of the trough. Reverse the direction of rotation periodically during development.

Rewind Equipment

The film is wound back and forth between two reels immersed in the solution. Processing solution/steps are below.

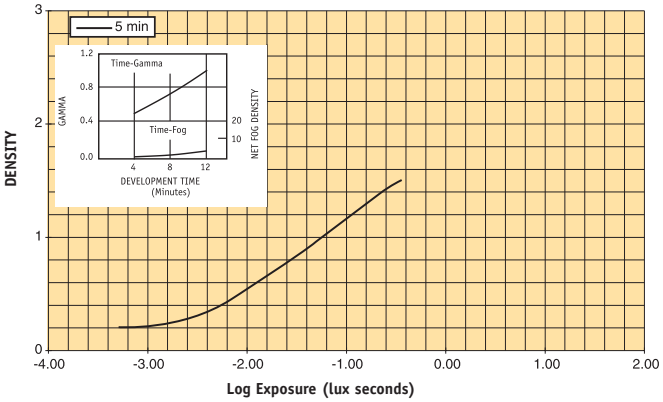
Agitate by winding the film back and forth continuously at a rate which will pass 100 feet of film from one reel to the other in approximately 60 seconds. Because of the large amount of time that the film is tightly wound as compared to the time it is in free contact with the solution, the times required in the various steps will depend on the length of the roll. During the wash, the water should be changed after each two windings of the film.

		Approximate Time in Minutes for Fresh Solution		
Solution/Step	Rec Temp	Rack-and-Tank	Reel-and-Trough	Rewind Tank[1]
Preharden: KODAK Special Hardener SH-5	18-21°C (65-70°F)	—	—	10
Develop: KODAK Developer: D-76 plus 20 grams/L KODAK Balanced Alkali	21°C (70°F)	—	—	11
or DK-60a	21°C (70°F)	—	—	15
or D-76	21°C (70°F)	6	7	—
or D-96	21°C (70°F)	6½	—	—
Stop: KODAK Stop Bath SB-1A	18-21°C (65-70°F)	½	½	4
Fix: KODAK Rapid Fixer	18-21°C (65-70°F)	3-5	3-5	20
KODAK Fixer F-5 or F-6	18-21°C (65-70°F)	10-20	10-20	—
Wash: Running Water	18-21°C (65-70°F)	20-30	20-30	40
Dry	—	—	—	—

[1] These times are given for 100-foot rolls. Decrease times 25% for a 50-foot roll, 50% for a 25 foot roll.

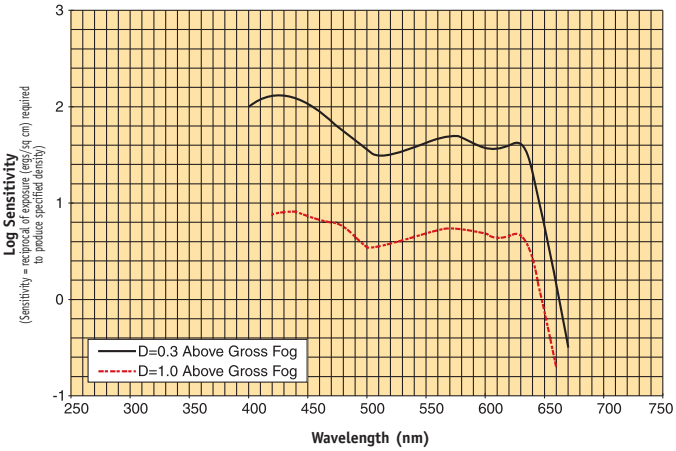
Sensitometric Curve

Exposure: Daylight, 1/50 sec, intensity-scale sensitometer
Processing: KODAK D-96 Developer at 21°C (70°F)
Densitometry: Status M (Blue)
Base Density=0.20



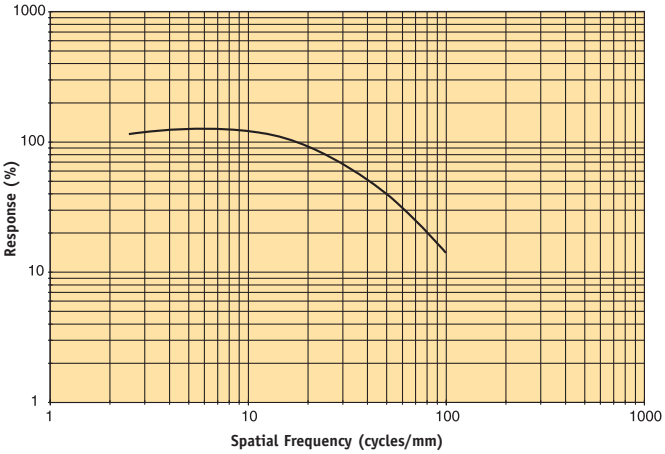
Spectral-Sensitivity Curves

Effective Exposure: 1.4 seconds
Process: KODAK D-96 Developer at 21°C (70°F) to the recommended control gamma
Densitometry: Diffuse visual



Modulation-Transfer Curve

Tungsten; KODAK D-96 Developer 21°C (70°F) to recommended control gamma
Diffuse visual



Note: These photographic modulation-transfer values were determined by using a method similar to the one described in ANSI Standard PH2.39-1977(R1992). The film was exposed with the specified illuminant to spatially varying sinusoidal test patterns having an aerial image modulation of a nominal 60 percent at the image plane, with processing as indicated. In most cases, the photographic modulation-transfer values are influenced by development-adjacency effects and are not equivalent to the true optical modulation-transfer curve of the emulsion layer in the particular photographic product.

IMAGE STRUCTURE

The modulation-transfer curves, the diffuse rms granularity, and the resolving power data were generated from samples of 5222 Film exposed with tungsten light and processed as recommended in KODAK D-96 Developer. For more information on image-structure characteristics, see KODAK Publication No. H-1, *KODAK Motion Picture Film*.

Diffuse RMS Granularity*14

Resolving Power†	TOC 1.6:1 TOC 1000:1	32 lines/mm 100 lines/mm

*Read at a net diffuse visual density of 1.0, using a 48-micrometer aperture.

†Determined according to a method similar to the one described in ISO 6328-1982, *Photography—Photographic Materials—Determination of ISO Resolving Power*.

Notice: While the data presented are typical of production coatings, they do not represent standards which must be met by Kodak. Varying storage, exposure, and processing conditions will affect results. The company reserves the right to change and improve product characteristics at any time.

IDENTIFICATION

After processing, the product code numbers 5222 or 7222, emulsion and roll number identification, KEYKODE Numbers, and internal product symbol (E) are visible along the length of the film.

AVAILABLE ROLL LENGTHS

For information on film roll lengths and formats, contact a Entertainment Imaging representative

KODAK LOCATIONS

For direct ordering
in the United States
and Canada:
1-800-621 FILM (3456)

Hollywood, California
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