

# EASTMAN Fine Grain Duplicating Panchromatic Negative Film 2234, 5234

Kodak

## TECHNICAL DATA

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EASTMAN Fine Grain Duplicating Panchromatic Negative Film 5234 and EASTMAN Fine Grain Duplicating Panchromatic Negative Film 2234, ESTAR Base, are panchromatic films characterized by very high sharpness. These low-speed, black-and-white films are designed for making duplicate negatives from master positives, or internegatives from reversal originals. When used with EASTMAN Fine Grain Duplicating Positive Film 2366, they produce negatives nearly equal to the original negative in tone rendering and printing detail.

### BASE

5234 Film has a gray acetate safety base. The back side of the base contains an anti-static layer with a carnauba wax lubricant.

2234 Film has a gray ESTAR Base (polyester). The backside of the base contains a process-surviving anti-static layer.

### DARKROOM RECOMMENDATIONS

Use a KODAK No. 3 Safelight Filter / dark green, with a 15-watt bulb, no closer to the film than 1.2 metres (4 feet).

### STORAGE

Store unexposed film at 13°C (55°F) or lower. For extended storage, store at -18°C (0°F) or lower. Process exposed film promptly.

Store processed film according to the recommendations in ISO 18911:2010, *Imaging Materials - Processed Safety Photographic Films - Storage Practices*. For medium-term storage (minimum of ten years), store at 25°C (77°F) or lower at a relative humidity of 20 to 50 percent. For extended-term storage (for preservation of material having permanent value), store 5234 Film at 7°C (45°F) or lower at a relative humidity of 20 to 30 percent; store 2234 Film at 21°C (70°F) or lower at a relative humidity of 20 to 50 percent. For active use, store at 25°C (77°F) or lower, at a relative humidity of 50 +/- 5 percent. This relates to optimized film handling rather than preservation; static, dust-attraction and curl-related problems are generally minimized at the higher relative humidity. After usage, the film should be returned to the appropriate medium- or long-term storage conditions as soon as possible.

### EXPOSURE

For traditional printing, the maximum negative density of the master positive should produce a density of 0.50 in the duplicate negative, i.e., just above the toe and at the beginning of the straight-line portion of the sensitometric curve.

### PROCESSING

The following process recommendations should be used 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.

**Note:** Observe precautionary information on product labels and on the Material Safety Data Sheets.

Processing Step	Temperature	Time	Replenishment Rate (mL per 100 ft)
KODAK Developer D-96*	70 +/- 1/2 F (21 +/- 0.3 C)	-†	1250 (D-96R)
Stop Rinse‡	70 +/- 2 F (21 +/- 1 C)	50 sec	12,000
KODAK Fixing Bath F-5*	70 +/- 2 F (21 +/- 1 C)	11 min	850
Wash (counter-current)	70 +/- 2 F (21 +/- 1 C)	10 min	12,000
Dry	95 F (35 C)	-¶	

\* Agitation in the developer and fixing bath should be by recirculation through submerged spray jets that impinge on the film strands.

† Develop to recommended control gamma.

‡ Countercurrent flow of fixer-laden water overflow from the wash tank, pH about 6.

¶ Many factors affect the drying: air temperature, relative humidity (RH); volume, rate and distribution of the air flow; final squeezeeeging, etc.

In a conventional convection-type drying cabinet with air at about 95°F (35°C) and 40 to 50 percent RH, drying will take 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 1/2 to 2/3 of the way through. Upon cooling to room temperature after leaving the dryer, the film should be in equilibrium with the room air at approximately 50 percent RH.

## IDENTIFICATION

After processing, the product code numbers 2234 or 5234, emulsion and roll identification, and KEYCODE product identifier (KD) are visible along the length of the film.

## IMAGE STRUCTURE

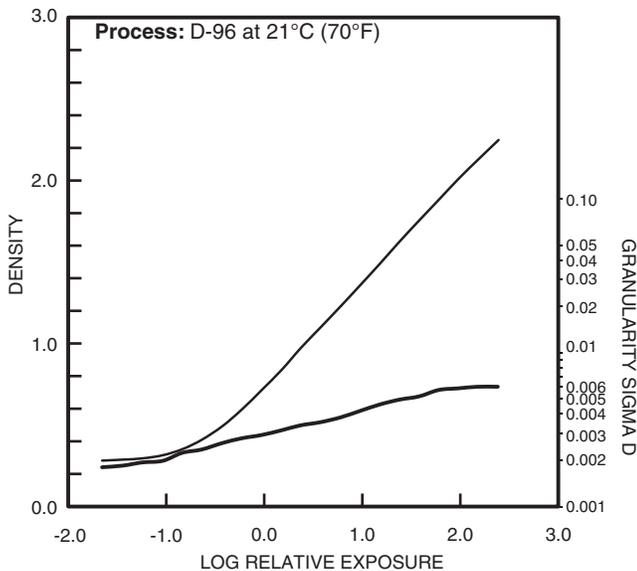
The modulation-transfer curves, the diffuse rms granularity, and the resolving-power data were generated from samples of 5234 Film exposed with tungsten light and processed as recommended in Process D-96 at 70°F (21°C) to the recommended control gamma. For more information on image-structure characteristics, see KODAK Publication No. H-1, *KODAK Motion Picture Film*.

### rms Granularity

Read with a microdensitometer, using a 48-micrometer aperture.

The "perception" of the graininess of any film is highly dependent on scene content, complexity, and density. Other factors, such as film age, processing, exposure conditions, and telecine transfer may also have significant effects.

**Diffuse rms Granularity Curves**

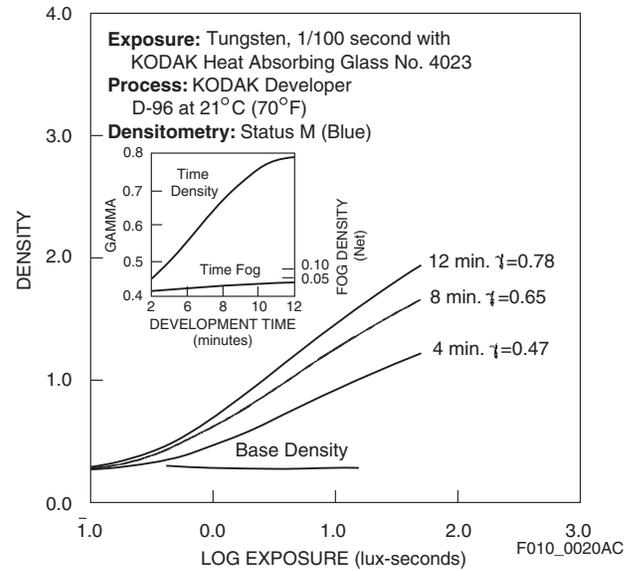


To find the rms Granularity value for a given density, find the density on the left vertical scale and follow horizontally to the characteristic curve and then go vertically (up or down) to the granularity curve. At that point, follow horizontally to the Granularity Sigma D scale on the right. Read the number and multiply by 1000 for the rms value.

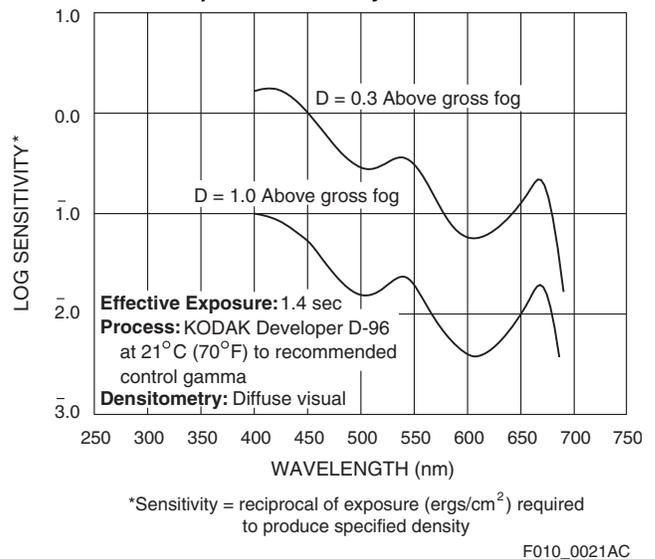
**Note:** This curve represents granularity based on modified measuring techniques. Sensitometric and Diffuse RMS Granularity curves are produced on different equipment. A slight variation in curve shape may be noticed.

## CURVES

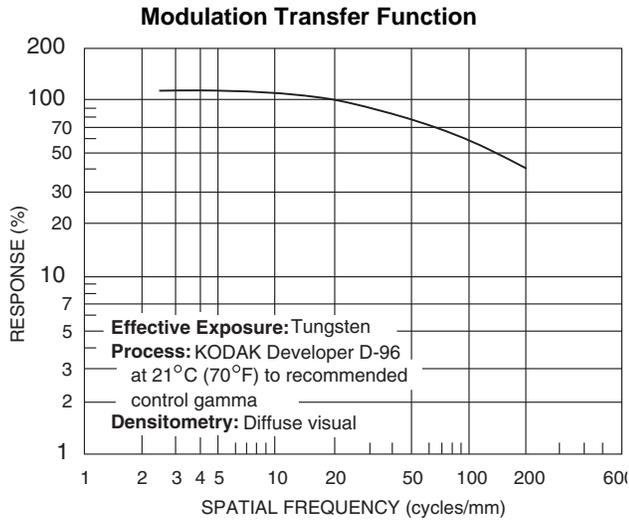
**Characteristic Curves**



**Spectral Sensitivity Curves**



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F010\_0022AC

**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.

## AVAILABLE ROLL LENGTHS

For information on film roll lengths, check the *KODAK Motion Picture Film Price Catalog* or see a Kodak sales representative in your country.

## MORE INFORMATION

Outside the United States and Canada, please contact your Kodak representative. You can also visit our web site at [www.kodak.com/go/motion](http://www.kodak.com/go/motion) for further information. You may want to bookmark our location so you can find us easily the next time.

<b>H-2</b>	<i>Cinematographer's Field Guide</i> <a href="http://www.kodak.com/go/fieldguide">www.kodak.com/go/fieldguide</a>
<b>H-845</b>	<i>The Essential Reference Guide for Filmmakers</i> <a href="http://www.kodak.com/go/referenceguide">www.kodak.com/go/referenceguide</a>
<b>H-24</b>	<i>Manual for Processing KODAK Motion Picture Films, Process ECP--2D Specifications, Module 9A</i> <a href="http://www.kodak.com/go/h24">www.kodak.com/go/h24</a>
<b>H-606</b>	<i>KODAK Telecine Tool Kit and Reference Manual</i> <a href="http://www.kodak.com/go/telecine">www.kodak.com/go/telecine</a>

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