

KODAK Technical Pan Film 2415 (ESTAR-AH Base)

- Black-and-white, panchromatic negative film having extended red sensitivity.
- Extremely fine grain and extremely high resolving power.
- Dimensionally stable; 0.004-inch (0.10 mm) ESTAR-AH Base with 0.1-density that suppresses halation and light-piping.
- Good latent-image keeping.
- Contrast can be varied with changes in development.
- Useful in photomicrography and other scientific, medical, biological, and industrial applications where high-definition photographic records are required.
- High-quality pictorial results can be obtained with low-contrast developers such as KODAK TECHNIDOL LC Developer.

Applications: In addition to pictorial photography with special developers, KODAK Technical Pan Film 2415 (ESTAR-AH Base) will be found useful in photomicrographic and photomacrographic situations. This film will provide additional levels of contrast for use with unstained specimens, phase contrast or other contrast-enhancing illumination, or at extreme magnifications. The film will also be useful in making black-and-white title slides, reduced copy negatives from black-and-white or color originals, lunar and planetary photography, and other applications where high resolution, high contrast, and maximum density are required. In photomicrography, a light-colored contrast filter such as KODAK WRATTEN Gelatin Filter No. 11 (yellowish-green) is suggested with most common histological stains.

In solar flare photography, laser recording, LED recording, and other applications in which exposures are accomplished with monochromatic light, the spectral sensitivity of this film, which extends beyond 690 nm, will be appreciated.

HANDLING

Load and unload the camera in subdued light.

Rewind the film *completely* into the magazine before unloading.

Darkroom Handling: Total darkness required. A KODAK Safelight Filter No. 3 (dark green) in a suitable lamp with a 15-watt bulb can be used for a few seconds only at 4 feet, after development is half completed.

EXPOSURE

The speed of this film depends upon the end use, the type and degree of development, and, consequently, the level of contrast desired. Therefore, no single speed value is appropriate for all situations. While all the EI speeds given below can be used as ISO (ASA/DIN) meter settings, they are properly identified as Exposure Indexes (EI), not ISO (ASA/DIN) speeds. These are suggested meter settings for trial exposures.

Pictorial Applications: To obtain contrast values normally recommended for pictorial work (CI = .56), use compensating developers such as KODAK TECHNIDOL LC Developer or POTA. Drop the loaded film reel into a full tank of developer solution.

35 mm Film				
Contrast	Contrast Index	Developer	Development Time (minutes)	Exposure Index
Pictorial (Daylight)	0.56	KODAK TECHNIDOL LC or POTA	8 at 86°F (30°C) 11 at 77°F (25°C) 15 at 68°F (20°C)	25/15°

Agitate 5 seconds every 30 seconds in a 1-pint tank.

Sheet Film				
Contrast	Contrast Index	Developer	Development Time @68°F (20°C)	Exposure Index
Pictorial (Daylight)	0.56	KODAK TECHNIDOL LC or POTA	10 minutes	25/15°

Continuous agitation in a tray.

Photomicrography: The following exposure index (EI) values are intended as starting points for trial exposures to give satisfactory results with meters or photomicrography equipment having through-the-lens meters of the ANSI type. Bracketing exposures by half-stop intervals is suggested for first tests.

Degree of Contrast Required	Contrast Index	KODAK Developer	Development Time at 68°F (20°C)	Exposure Index (Tungsten)
Maximum	2.40	D-19	4 minutes	125/22°
High	1.45	HC-110, Dilution D	6 minutes	100/21°
Moderate	0.85	HC-110, Dilution F	8 minutes	50/18°

Copy Applications: For exposure meters marked for ISO (ASA/DIN) speeds or exposure indexes:

Tungsten—320/26°*

(for incident-light readings and for reflected-light readings from gray card—18 percent reflectance—at the copyboard).

Tungsten—64/19°*

(for reflected-light readings from matte-white card—90-percent reflectance—at the copyboard).

*based on development with KODAK Developer D-19 for 4 minutes at 68°F (20°C) in a small tank with agitation at 30-second intervals.

The preceding values are intended as starting points.

When using a through-the-lens metering camera, replace the copy with a gray card while establishing exposure; otherwise, the camera may give incorrect readings, depending on the amount of text in the copy.

As an alternative to using an exposure meter to determine exposures, the following examples can be used as starting points to obtain correct exposure: With two No. 2 photolamps in matte-surfaced reflectors at about 4 feet from the copyboard, expose for 1/60 second at $f/8$. With two No. 1 photolamps, exposures will be approximately twice that needed with No. 2 photolamps.

Filter Factors: When a filter is used, determine the normal exposure without the filter. Then multiply the normal exposure by the filter factor given below.

KODAK WRATTEN Gelatin Filter	Filter Factor*	Filter Factor†
No. 8	1.2	1.5
No. 11	5	—
No. 12	1.2	—
No. 13	6	—
No. 15	1.2	2
No. 25	2	3
No. 38	—	3
No. 47	25	—
No. 58	12	—

*Based on a 1-second tungsten exposure and development in KODAK HC-110 Developer, Dilution D, at 68°F (20°C) for 8 minutes.

†Based on a 1/25-second daylight exposure and development in KODAK TECHNIDOL LC or POTA Developers at 68°F (20°C) for 15 minutes.

PROCESSING PROCEDURE

Procedure for processing in small tanks with spiral reels using agitation at 30-second intervals:

- 1. Develop** to the desired contrast index as specified in the section on "Exposure." Refer to KODAK Pamphlet P-255 for further details.
- 2. Rinse** at 65 to 70°F (18 to 21°C) in KODAK Indicator Stop Bath, KODAK Stop Bath SB-1a, or KODAK Stop Bath SB-5 for 15 to 30 seconds. Use running water for 30 seconds if no stop bath is used.
- 3. Fix** at 65 to 70°F (18 to 21°C), with frequent agitation.
 - KODAK Rapid Fixer —1½ to 3 minutes
 - KODAK Fixer —2 to 4 minutes
 - KODAK Fixing Bath F-5—2 to 4 minutes

- 4. Wash** in clear, running water at 65 to 70°F (18 to 21°C) for 5 to 15 minutes.

To save time and conserve water, use KODAK Hypo Clearing Agent. First rinse the fixed film in running water for 15 seconds. Next bathe the film in KODAK Hypo Clearing Agent for 30 seconds with agitation. Then wash the film for 1 minute in running water at 65 to 70°F (18 to 21°C), allowing at least one change of water during this time.

- 5. Dry** in a dust-free place. Heated forced air at 120 to 140°F (49 to 60°C) may be used to reduce drying time.

MACHINE PROCESSING

For information on processing this film in the KODAK VERSAMAT Film Processor, Model 11C, write to Eastman Kodak Company, Consumer/Professional & Finishing Markets Publications, Rochester, New York 14650.

STORAGE

Store unexposed film at 70°F (21°C) or lower in the original sealed container. Aging effects are lessened by storing the film at lower temperatures. If film has been refrigerated, allow the package to reach room temperature for 2 to 3 hours before opening; if frozen, allow 5 hours.

Store processed film in a cool, dry place.

ADDITIONAL INFORMATION

For more complete information regarding specialized applications, processing, exposure, and other details, refer to KODAK Pamphlet No. P-255, KODAK Technical Pan Film 2415. A single copy may be obtained free of charge from Department 412-L, Eastman Kodak Company, 343 State Street, Rochester, NY 14650.

The Kodak materials described in this publication for use with KODAK Technical Pan Film 2415 (ESTAR-AH Base) are available from those dealers normally supplying Kodak products. Other materials may be used, but equivalent results may not be obtained.

Notice: This film will be replaced if defective in manufacture, labeling, or packaging, even though caused by our negligence or other fault. Except for such replacement, the sale or any subsequent handling of this film is without other warranty or liability.

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