

KODAK Mapping Film ER4



KODAK Mapping Film ER4 is an extremely high contrast film designed for use in red laser plotters or imagesetters for large size reproductions of engineering drawings or maps.

ER4 Film is manufactured on a dimensionally stable 4-mil (0.10 mm) ESTAR Base, and produces sharp line and dot images. This red-sensitive film is especially suited for use on helium-neon (HN; 633 nm) laser or red laser diode (630 to 670 nm) recording devices.

Process ER4 in KODAK ACCUMAX Rapid Access Developer and Replenisher or another conventional rapid-access developer. This film *cannot* be processed in lith developers or KODAK ULTRALINE Developer and Replenisher.

STORAGE

Keep unexposed film and processed film in a cool, dry place, preferably at a temperature of 70° F (21° C) or lower and 50% RH. Process film as soon as possible after exposure.

SAFELIGHT

Use an EncapSulite T20/ND.75 safelight. Keep the film at least 4 feet (1.2 metres) from the safelight. Do not expose the film to safelight illumination for longer than two minutes.

EXPOSURE

Follow exposure procedures recommended by the equipment manufacturer.

This film is designed for use on recorders and imagesetters that use a helium-neon laser (HN; 633 nm) or a red laser diode (630 to 670 nm) as the exposing source.

RECIPROCITY

With recommended processing, the reciprocity speed change is negligible (1/3-photographic stop or less) within exposure range of 1/1000 second to 100 seconds; there is no change in contrast.

PROCESSING

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

Tray Processing:

Develop with continuous agitation using KODAK ACCUMAX Rapid Access Developer and Replenisher (1:2).

Temperature	Recommended Time (Minutes)	Useful Range* (Minutes)
65° F (18° C)	4	3 1/2 to 4 1/2
68° F (20° C)	3 3/4	3 1/4 to 4 1/4
70° F (21° C)	3 1/2	3 to 4
75° F (24° C)	2 3/4	2 to 3
80° F (27° C)	2	1 1/2 to 2 1/2

* Satisfactory results can usually be obtained from properly exposed films within this range.

Rinse at 65 to 80° F (18 to 27° C) with agitation.

KODAK 4001 Stop Bath	10 seconds
KODAK Indicator Stop Bath	10 seconds
Diluted 4% acetic acid solution	10 seconds

Fix at 65 to 80° F (18 to 27° C) with frequent agitation.

KODAK ULTRALINE Fixer and Replenisher (1:3)	1 to 2 minutes
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Wash at 65 to 80° F (18 to 27° C) in running water for about 10 minutes. KODAK PHOTO-FLO Solution may be used after washing to minimize water spots and drying marks.

Dry in a dust-free place.

Tray Life -- Aeration Time:

The developer's useful life depends on the surface area and volume of developer used (ratio of surface area to volume). Aerial oxidation usually occurs within 4 to 8 hours, depending on the depth and area of developer.

General guidelines are:

4 hours for shallow tray (developer depth 1 inch or less)

8 hours for deep tray (developer depth 3 inches or less)

Pepper spots will appear when developer has been oxidized due to excessive exposure to air.

Capacity:

The useful capacity of KODAK ACCUMAX Rapid Access Developer and Replenisher (1:2) is at least 150 8 x 10-inch (20.3 x 25.4 CM) sheets/gal (3.8 L), about 83 sq ft/gal (7.7 sq m/3.8 L), at 50% exposure.

Use of Stops Baths:

Stop baths check development, tend to prevent any spots or streaks, and prolong the life of the fixing bath.

Drying Marks:

To minimize drying marks, wipe surfaces carefully with a KODAK Photo Chamois, a soft, wet viscose sponge, or a soft squeegee such as a windshield wiper blade.

Developer Contamination with Fixer:

Contamination of the developer with small amounts of fixer will result in a high number of pepper spots on film.

To prevent developer contamination:

- Do not interchange trays used for fixer and developer. Designate exclusive trays for developer and fixer.
- Avoid splashing fixer into the developer.
- Use separate stirring paddles for developer and fixer.

Mechanized Processing:

Use KODAK ACCUMAX Rapid Access Developer and Replenisher (diluted 1:2) or KODAK RA 2000 Developer and Replenisher (diluted 1:2). For fixing, use KODAK ULTRALINE Fixer and Replenisher (diluted 1:3).

Recommended Starting Points

Developer Temperature	Time
ACCUMAX Rapid Access Developer	
100° F (38° C)	30 seconds
95° F (35° C)	45 seconds
90° F (32° C)	60 seconds
RA 2000 Developer	
95° F (35° C)	30 seconds
90° F (32° C)	45 seconds

Replenishment Rates

Developer	Fixer
0.30 mL / sq in. (465 mL / sq m)	0.35 mL / sq in. (540 mL / sq m)

RETOUCHING

Photographic-image lines can be removed with any commercially available eradicator solution. Contact a photographic supplies dealer.

DIMENSIONAL STABILITY

Dimensional stability is an all-inclusive term. In photography, it applies to size changes caused by changes in humidity and in temperature, and by processing and aging. The dimensional properties of ESTAR Base may vary slightly in different directions within a sheet; the differences that may exist, however, are not always equal in both the length and width directions.

Differences in size change between length and width should be within 10 percent of each other.

Thermal Coefficient of Linear Expansion:

Unprocessed or	0.001% per degree F
Processed	0.0018% per degree C

Humidity Coefficient of Linear Expansion:

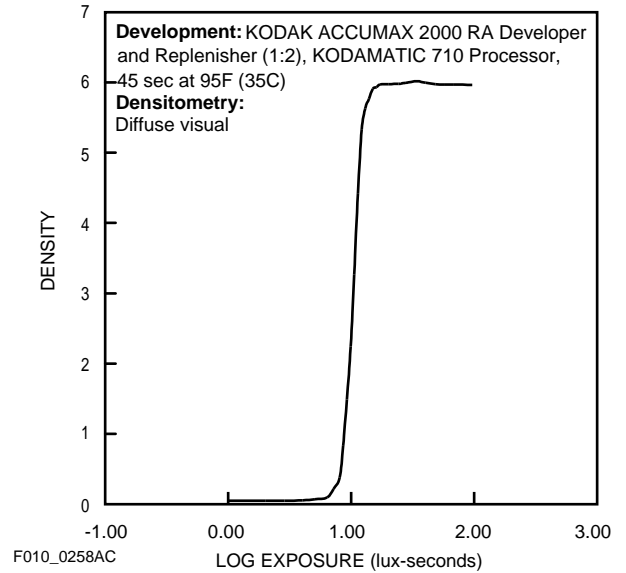
Unprocessed	0.0017% per % RH
Processed	0.0016% per % RH

Processing Dimensional Change:

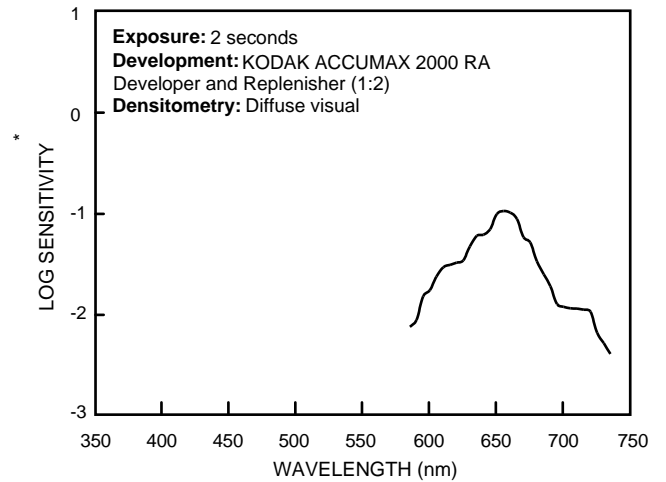
Dependent on drying conditions

CURVES

Characteristic Curve



Spectral Sensitivity



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

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MORE INFORMATION

For the latest version of technical support publications for Kodak products, visit Kodak on-line at:
<http://www.kodak.com/go/SDRproducts>

If you have questions about Kodak products, call Kodak.

In the U.S.A.:

1-800-242-2424, Ext. 19, Monday–Friday
9 a.m.–7 p.m. (Eastern time)

In Canada:

1-800-465-6325, Monday–Friday
8 a.m.–5 p.m. (Eastern time)

From outside the US/Canada: 1-716-724-4000

Note: The Kodak materials described in this publication for use with KODAK Mapping Film ER4 are available from dealers who supply Kodak products. You can use other materials, but you may not obtain similar results.

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.

Industrial Imaging
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