

# Photographic Film

Revised 2018

## Storage Conditions

The following information applies to both photographic film and photographic paper. The same conditions are recommended for both products. Relative humidity (RH) in the storage room should be between 40% and 55%, preferably nearer 40%. Humidity above 55% increases the potential for change or damage. For color and motion picture film, relative humidity should not exceed 50%. Film adequately protected by vapor-barrier packaging may be stored at RH up to 70%.

Upon removal from refrigeration, the film or paper should be allowed to warm-up before opening any vapor or moisture seals to prevent condensation and subsequent damage from occurring upon opening.

Storage Temperatures			
2 Months	6 Months	12 Months	1 Year+
75°F (24°C) or lower	60°F (16°C) or lower 45-55°F (7-13°C) for color	50°F or lower (10°C)	0 to -10°F (-18 to -23°C)

Storage temperature requirements vary with different film types. Professional film normally would be entirely different than requirements for consumer film. Specific recommendations printed on the box of film should be followed.

Some scientific film must be stored at 0 to -10°F (-18 to -23°C) for their entire storage life.

Refrigerated storage is not absolutely required for black and white film, but they do age less in refrigerated storage.

Tempering of the film after storage is very important to avoid condensation on, and therefore damage to, the film.

Photosensitive materials deteriorate with age, but the rate of deterioration is largely dependent on storage conditions. High temperature and high relative humidity will speed the deterioration, while, conversely, low temperature and humidity will slow down the deterioration process with the exception of high-speed film products (ISO 1000 or higher) where background radiation may be the dominant factor in product change. Eastman Kodak's Storage and Preservation of Motion Picture Film states: "Sensitized films must be considered perishable just like meat or dairy products and given proper care."

Photographic film is a sensitive product and must be protected from moisture as well as damaging oxidizing vapors such as hydrogen sulfide, sulfur dioxide, ozone, formaldehyde, paint, etc. Moisture/vapor resistant packaging is adequate in temperate climates; for climates with higher humidity and temperatures, packaging requirements should be obtained from the manufacturer. All film should be stored at least 6 inches off the floor, and protected from heat sources, accidental water damage and mold.

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Film in original manufacturer's shipping cartons can be stacked 6 cases high and motion picture film should be stored no more than 6-8 cans high.

Color film is more sensitive than black-and-white, but neither should be subjected to long periods of ambient storage once opened. Regardless of the care in storage, all film should be used before its expiration date.

### Care of Processed Film

In order to slow potential image and color changes, processed film should, in general, be stored in a dark, dry and cool place.

Although storage temperature may not be as critical for processed film as for the unexposed or unprocessed film or paper, an even lower relative humidity is desirable. Thus, a temperature of 70°F (21°C) or less may be adequate, but relative humidity recommended is between 25 and 40%. The 100 rule (°F + RH) generally applicable to seed storage is generally applicable for processed film, except that RH below 25% should be avoided because excessive brittleness may result. Within these limits, the low temperature and low humidity storage will not only slow image changes, but also protect against mold growth and insect infestation. In general, both extremely low and extremely high humidity should be avoided. When materials are to be kept for long periods of time (archival keeping), proper enclosure materials (envelopes, boxes, etc.) should be used.

<b>Negatives</b>	Negatives for current use can be kept in normal room conditions. If humidity regularly approaches 60%, a dehumidifier should be used. Light can affect dyes, thus keep in a dark place. For extended storage for long periods, more elaborate care is needed. A temperature of 0°F (-18°C) and a RH of 30 to 35% are excellent for long term storage.
<b>Color Slides</b>	Slides and transparencies can be kept for long periods in normal room conditions. When not being viewed or displayed, they should be stored in the same way as color negatives, i.e., for very long life, store in the dark at 0°F (-18°C) and RH between 30-35%. Light can affect dyes, thus keep in a dark place.  Projection life of a color slide will vary depending on type of film. Kodachrome will give evidence of a 10% loss of magenta dye after 240, 15-second projections. Ektachrome slides will withstand 2-3 times as many projections before the same amount of magenta loss would occur. Generally, a 10% dye loss will be perceived as a just noticeable difference.
<b>Color Prints</b>	The best conditions for extended storage of color prints are the same as those for other color photographic products, i.e., dark, dry and cool place, store below 75°F (24°C) and 50% RH, in the dark. For longer term storage, keep prints at reduced temperatures. If stored at 0°F (-18°C), prints should be conditioned before sealing for storage.  Upon removal from refrigeration, the film or paper should be allowed to warm-up before opening any vapor or moisture seals to prevent condensation and subsequent damage from occurring upon opening.

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## Reference

**Storage and Care of Kodak Films and Papers**, Kodak Publication No. E-30. Single copies can be obtained free by request to Department 412-L, Eastman Kodak Co., Rochester, NY 14650.

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WFLO is indebted to Douglas J. Lang, Director, Film Team, Eastman Kodak, Rochester, New York, for the review and revision of this topic.