

# INSTRUCTION FOR USE OF THE KODAK HYPO ESTIMATOR



The KODAK Hypo Estimator is recommended for use with KODAK Hypo Test Solution HT-2 to provide a relatively simple method of estimating the amount of thiosulfate ion ("hypo") retained in a processed black-and-white negative or print. This solution is available premixed as the KODAK Hypo Test Kit, or you can make it yourself as follows.

## KODAK Hypo Test Solution HT-2

Water	750 mL
*KODAK 28% Acetic Acid	125 mL
KODAK Silver Nitrate	7.5 grams
Water to make	1.0 litre

\*To make approximately 28% acetic acid from glacial acetic acid, with caution add 3 parts of glacial acetic acid to 8 parts of water.

Store the solution in a screw-cap or glass-stoppered brown bottle, away from strong light. When the solution is properly stored, its useful life is about 2 years. Do not allow the solution to come into contact with hands, clothing, negatives, prints, or unprocessed photographic material, because it will stain them black.

## TEST METHOD FOR BLACK-AND-WHITE PHOTOGRAPHIC FILMS AND PLATES

Place one drop of the KODAK Hypo Test Solution HT-2 in a clear area on the emulsion side of the dry, recently processed film or plate. Select an area of the film (such as a margin or the lead or trail end of a roll) that has no photographic value, since the film may be permanently stained. Allow the solution to stand for 2 minutes, then blot off the excess solution and immediately compare the stain with the density patches of the KODAK Hypo Estimator.

Make the comparison as follows:

1. Examine the test spot under diffuse daylight or room light. Avoid direct sunlight.†
2. For easier viewing, place the film or plate on a sheet of white paper.
3. With the hypo estimator in its sleeve (for protection), center the test spot between the density patches until you find the patch that approximately matches the test spot.

If in doubt as to the uniformity of hypo removal, test several areas on both the emulsion and base sides of the film. (Select different areas on each side, so that the spots will not superimpose.)

## Test Interpretation

Test spots matching the various patches of the hypo estimator correspond approximately to the following hypo contents:

Density of Stain	Estimated Grams of Thiosulfate Ion (per square m)
1	0.01
2	0.02
3	0.05
4	0.12

The test can be used as a rough guide in determining washing quality. Film that is to be kept for long periods of time should meet the archival washing quality standard of either ANSI Standard PH1.28-1981, "Specifications for Photographic Film for Archival Records, Silver-Gelatin Type, on Cellulose Ester Base," or ANSI Standard PH1.41-1981, "Specifications for Photographic Film for Archival Records, Silver-Gelatin Type, on Polyester Base," and be kept according to the specifications of ANSI Standard PH1.43-1983, "Practice for Storage of Processed Safety Photographic Film Other Than Microfilm."

Film that is intended for archival use should not exceed the density of the patches as follows:

Type of Film	Density
Class 1—Fine-grain copying, duplicating, and printing films	less than on patch 1
Class 2—Medium-grain continuous-tone camera films (negative and reversal) and coarse-grain x-ray films	patch 2

†Direct sunlight will cause the spot to darken rapidly, and prolonged delay between the blotting of the solution and comparison will also allow the spot to darken.

**TEST METHOD FOR BLACK-AND-WHITE PHOTOGRAPHIC PAPERS**

Wipe the excess water from the face (emulsion side) of a blank piece of the same photographic paper processed with the batch of prints (or from the extra margin area of one of the prints). The area of paper chosen should have no photographic value, since the paper may be permanently stained. Place one drop of the KODAK Hypo Test Solution HT-2 on the face of this processed paper sample. Allow the solution to stand on the paper sample for 2 minutes, blot to remove the excess test solution, and then immediately compare the stain with the tint patches on the KODAK Hypo Estimator.

Make the comparison as follows:

1. Examine the test spot under diffuse daylight or room light. Avoid direct sunlight.
2. With the hypo estimator in its sleeve (for protection), center the test spot between the density patches until you find the patch that approximately matches the test spot.

**Test Interpretation**

For acceptable washing, the test spot should be no darker than the comparison patch listed in the table below:

KODAK Papers	Acceptable Spot Density
<b>Group 1</b> INDUSTREX Rapid 700 KODAGRAPH TRANSTAR Paper TP5 KODAGRAPH TRANSTAR Paper TPP5 Contact POLYCONTRAST Rapid II RC KODABROME II RC PANALURE II RC PANALURE II Repro RC POLYPRINT RC PREMIER II RC	very little or no discoloration

**Group 2**

- KODAGRAPH AUTOPOSITIVE
  - EKTALURE
  - EKTAMATIC SC (fixed and washed)
  - Mural
  - PANALURE
  - ELITE Fine-Art
  - POLYFIBER
- patch 2

**Group 3**

- KODABROMIDE
  - AZO
  - VELOX
  - VELOX UNICONTRAST
- patch 3

**Group 4**

- KODAGRAPH Projection
  - LINAGRAPH 2201/1930 (for electrocardiograph purposes)
- patch 4

**NOTE:** The spot test is reliable when KODAK Hypo Clearing Agent has been used, but it may give misleading results after certain other washing aids have been employed. The face side may show less stain than prints washed only in water, although the total hypo content (in the emulsion plus the paper base) may be equal in the two cases. In such case it is desirable to measure the reflection density of the stain after total immersion of the print or sample.

**QUANTITIVE TEST FOR RESIDUAL HYPO**

This test procedure does not conform with the ANSI method of determining residual thiosulfate levels. To determine the exact level of thiosulfate retained in black-and-white photographic papers, use the procedure described in ANSI Standard PH4.8-1985, "Determination and Measurement of Residual Thiosulfate and Other Chemicals in Films, Plates, and Papers."

**SOURCES FOR MORE INFORMATION**

ANSI Standards: American National Standards Institute, Inc., 1430 Broadway, New York, New York 10018.



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