

# Motion Picture Printer Steadiness Analysis



## INTRODUCTION

Visual steadiness of a projected motion picture image on a screen has always been a topic of interest to those who view them, but it is of the utmost importance to the success or failure of those who produce multiple copies for screening. Organizations, such as ANSI and SMPTE, have done an excellent job providing standards for the manufacture, capture and display of motion picture images, but an objective measurement technique has eluded most. Tools like the SMPTE RP-40 Chart provide a basic technique to evaluate the percentage of horizontal and vertical movement by subjectively determining the amount of movement in reference to a stationary object and then mathematically calculating a percentage.

Eastman Kodak Company has developed an objective method of steadiness evaluation that incorporates CCD sensors positioned at the screen and interpolation software designed to capture both vertical and horizontal movement within a specified increment of screen time. An ESTAR-based KODAK VISION Color Intermediate Film / 2242 digital original grid, produced on a highly stable film recorder, is used as the printing original test target on the continuous contact printer to be measured. Dimensional measurements of the KODAK VISION Color Intermediate Film / 2242 raw stock are pre-determined to be within tightened ANSI specifications. Both the resultant test target print and the unprocessed KODAK VISION Color Print Film / 2383 raw stock used to strike the test target print are measured with the Steadiness Gauge. The data is analyzed by the software and provides a series of graphs for both the test target print and the unprocessed color print raw stock. A mathematical derivation determines the relative amount of vertical and horizontal movement produced by the printer by recognizing repeat patterns. Known manufacturing and projection equipment signals are then subtracted from the equation allowing potential printer related aberrations, such as a faulty drive sprocket, to be recognized. Once they are finger printed, corrective action guidelines can be initiated.

## Test Kit Contents

Eastman Kodak Company will provide the following items to each customer:

1. One KODAK Printer Steadiness Kit Test Target (CAN #1).
2. One set of Steadiness Test printing instructions.
3. One labeled can for the 200-foot (61 meter) unexposed (fogged)/unprocessed print stock (CAN #2).
4. One labeled film can for the 400-foot (122 meter) exposed/processed print stock (CAN #3).
5. One labeled film can for the 200-foot (61 meter) unexposed (fogged)/processed print stock (CAN #4).
6. Pre-addressed, pre-paid air express airway bills for the return of samples to be evaluated by Eastman Kodak Company.

## Procedure

- The entire test target printing original should be printed using standard operating conditions for that printer (e.g. normal operating speed, thread-up path, etc.) using any current emulsion of VISION Color Print Film / 2383.
- Break down the 800-foot (244 meter) roll of VISION Color Print Film / 2383 into two 200-foot (61 meter) rolls and one 400-foot (122 meter) roll. The two 200-foot (61 meter) rolls should be exposed to white light (fogged).
- Label one 200-foot (61 meter) unexposed (fogged)/unprocessed print stock and place it into CAN #2.
- Print the KODAK Printer Steadiness Test Target (CAN #1) onto the 400-foot (122 meter) roll of print stock. Print to status A density: R=1.00, G=1.30, and B=1.20, +/- ~1.5 printer points (+/- 0.10). This is achieved by printing and controlling the density of the standard gray patch on the head end Laboratory Aim Density (LAD) chart.
- Splice the second 200-foot (61 meter) unexposed (fogged) print stock to the 400-foot (122 meter) exposed print stock.
- Process the 200-foot (61 meter) unexposed (fogged) print stock and the 400-foot (122 meter) exposed print stock in your standard ECP-2D process.
- Break down the 400-foot (122 meter) exposed/processed print stock (CAN #3) and the 200-foot (61 meter) unexposed (fogged)/processed print stock (CAN #4).

- Label each print as to the printer used, and if possible, the processing machine used. Please include the date and time printed also. (All identifying information will be held private between Eastman Kodak Company and the laboratory.)
- Place the 400-foot (122 meter) exposed/processed print stock into CAN #3 supplied by Kodak and the 200-foot (61 m) unexposed (fogged)/processed print stock into CAN #4 supplied by Kodak.

## Shipping Instructions

1. Collect the printer steadiness test target and test samples. The following samples should be returned to Eastman Kodak Company:
  - KODAK Printer Steadiness Test Target (CAN #1).
  - One 200-foot (61 meter) unexposed (fogged)/unprocessed print stock (CAN #2).
  - One 400-foot (122 meter) exposed/processed print stock (CAN #3).
  - One 200-foot (61 meter) unexposed (fogged)/processed print stock (CAN #4).
  - Note: The cardboard box used to ship the test kit can be used to return the test samples to Eastman Kodak

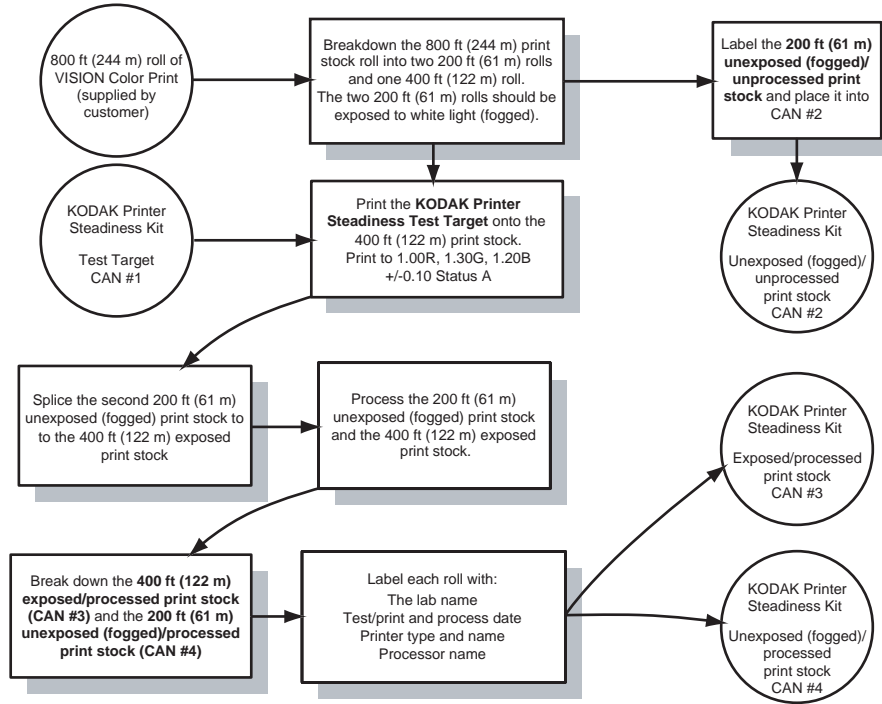
Company.

2. Complete the "Shipper Address" information on the airwaybill and fasten the airwaybill to the box.
3. Customers outside the United States may be required to complete a commercial invoice to return the samples to Eastman Kodak Company. The test samples can be identified as:
  - Three (3) "Motion Picture test film, exposed and processed." Declared value=\$25.00 USD
  - One (1) "Motion picture test target, exposed and processed." Declared value=\$45.00 USD
4. Please forward the air express airbill number to your local sales engineer or account manager and Eastman Kodak Company will track the package. The Motion Picture Printer Steadiness Analysis report will be returned to you within five working days after we receive the samples.

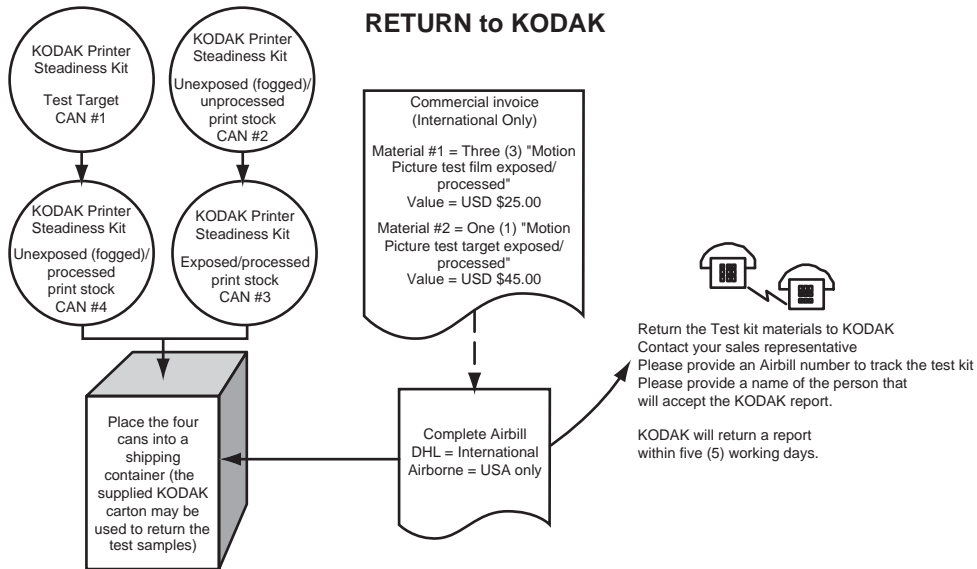
Please return all prints to:

Worldwide Technical Services  
 Eastman Kodak Company  
 B-69 Research Labs  
 1700 Dewey Avenue  
 Rochester, NY 14650-1922  
 (Phone: 585-722-5431)

## Printer Steadiness Test Kit Instructions



## RETURN to KODAK



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