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**IT8.7/2-1993**  
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## AMERICAN NATIONAL STANDARD

# Graphic technology — Color reflection target for input scanner calibration

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# IT8

SECRETARIAT  
NPES THE ASSOCIATION FOR SUPPLIERS OF PRINTING, PUBLISHING  
AND CONVERTING TECHNOLOGIES

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## AMERICAN NATIONAL STANDARD

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## FOREWORD

(This foreword is not a part of American National Standard IT8.7/2-1993,  
Graphic technology—Color reflection target for input scanner calibration.)

The intent of this standard is to define an input test target that will allow any color input scanner to be calibrated with any film dye set used to create the target.

The IT8 Committee was accredited by the American National Standards Institute in 1987 to facilitate the development of standards for digital data exchange.

The IT8 Committee recommends the voluntary implementation and use of this standard by the prepress segment of the graphic arts industry at its earliest convenience.

Suggestions for improving this standard are welcome. They should be sent to Secretariat, NPES The Association for Suppliers of Printing, Publishing and Converting Technologies, 1899 Preston White Drive, Reston, VA 20191-4367. Technical questions and requests for clarification should also be addressed in writing to the Secretariat.

This standard was prepared by IT8 Subcommittee 4 and was processed and approved for submittal to ANSI by Accredited Standards Committee IT8. Committee approval of the standard does not necessarily imply that all committee members voted for its approval. At the time this standard was approved the leadership of IT8 was as follows:

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## Graphic technology — Color reflection target for input scanner calibration

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## **Graphic technology — Color reflection target for input scanner calibration**

### **Introduction**

#### **Purpose**

Color input scanners do not all analyze color the same way the human eye does. These devices are designed to optimize the signal generated when typical materials are scanned. Color reflection products use various combinations of proprietary dye sets to produce visual responses that simulate the color appearance of natural scene elements. The ability to produce the same color appearance from different combinations of dyes is referred to as metamerism. Because both dyes and scanner sensitivities vary from product to product, there is a variability in the scanner response to metameric colors produced by the various materials.

The intent of this standard is to define an input test target that will allow any color input scanner to be calibrated with any photographic paper dye set used to create the target. This standard is intended to address the color photographic paper products which are generally used for input to the preparatory process for printing and publishing.

The target was designed to be useable for calibration by visual comparison and as a numerical data target for electronic systems and future development. The target design made use of a uniform color space to optimize the spacing of target patches. The tolerances developed for individual patches meet the values needed for both numerical and visual analysis.

This standard represents the second part of a multi-part standard which addresses graphic arts color definition issues. IT8.7/1, "Graphic technology — Color transmission target for input scanner calibration" and IT8.7/3, "Graphic technology — Input data for characterization of 4-color process printing" are companion documents.

### **Technical background**

#### **Design of target**

The CIE 1976 ( $L^*a^*b^*$ ) or CIELAB color space was chosen as the space to be used for the design of the color calibration target. Uniform spacing in hue, lightness and chroma, and tolerancing in terms of differences in these parameters ( $\Delta E^*_{ab}$ ) is believed to provide a reasonable distribution of target patches in the most effective manner.

The design goal of the committee was to define a target that would have, as its main part, as many common colored patches as was practical, regardless of dye set used. It was determined that the remainder of the target should define the unique color characteristics of the particular dye set used to create a specific target; the values for each target element should be established using a common procedure.

To provide a reasonable measure of the color gamut that is within the capability of modern color photographic papers, all manufacturers of these papers were invited to provide color dye data along with the necessary minimum and maximum density data for each of their image forming color dye sets. Data were provided by Agfa Company, Eastman Kodak Company, Fuji Photo Film Company, and Konica Corporation. These data were then used to estimate the CIELAB color gamut that each dye set could produce. This estimate was achieved by mathematical modelling (by several of the participating