

specifications can be seen as being primarily relevant where successive viewing of hard copy and soft copy takes place. Another standard, ISO 12646 *Graphic Technology—Colour proofing using a colour monitor*, currently in preparation, is being developed by TC130 to provide a more detailed recommendation where direct comparison is required.

The specifications in ISO 3664 include the following requirements:

- The chromaticity of the white displayed on the monitor should approximate that of  $D_{65}$ . The luminance level of the white displayed on the monitor shall be greater than  $75 \text{ cd/m}^2$  and should be greater than  $100 \text{ cd/m}^2$ .
- When measured in any plane around the monitor or observer, the level of ambient illumination shall be less than 64 lux and should be less than 32 lux. The color temperature of the ambient illumination shall be less than or equal to that of the monitor white point.
- The area immediately surrounding the displayed image shall be neutral, preferably grey or black to minimize flare, and of approximately the same chromaticity as the white point of the monitor.
- The monitor shall be situated so there are no strongly colored areas (including clothing) directly in the field of view or which may cause reflections in the monitor screen. Ideally all walls, floors, and furniture in the field of view should be grey and free of any posters, notices, pictures, wording, or any other object which may affect the viewer's vision.
- All sources of glare should be avoided since they significantly degrade the quality of the image. The monitor shall be situated so that no illumination sources such as unshielded lamps or windows are directly in the field of view or are causing reflections from the surface of the monitor.

These are things that are seldom done today. Having clearly specified goals, however, should allow us to

move one more step forward in the communication of the appearance of color images on a monitor.

## *The presence of colored objects within the viewing environment is a potential problem.*

### Other Items

ISO 3664 also includes a section on test conditions and an annex that describes some of the experimental data used to evaluate the validity of the standard.

Because "the subjective impression produced by photographs that are judged for contests or juried exhibitions is of particular importance," an informative annex in the standard provides "Guidelines for the Judging and Exhibiting of Photographs" (remember, this is a joint graphic arts and photographic standard). A summary of the conditions specified in this annex can be found in Table II.

### Conclusions

As the demand for process color printing continues to rise and customers expect greater color consistency and quality, the need for standard viewing conditions for color appraisal becomes more acute. The graphic arts industry is a highly segmented manufacturing process with many

individuals, frequently from different companies, involved in the reproduction of color images. The nature of color perception makes the communication process even more difficult.

It is essential for the visual communication process to operate under a standard set of illumination conditions. The new version of ISO 3664, which will be available in early 1999, provides a thorough and clearly defined set of viewing conditions for the graphic arts. Conscientious use of viewing equipment that meets the ISO specifications helps to eliminate confusion and mistakes caused by uncontrolled lighting conditions during critical color decisions.

A copy of the final draft of ISO 3664, and the published standard as soon as it is available, may be obtained from NPES The Association for Suppliers of Printing and Publishing Technologies, 1899 Preston White Drive, Reston, VA 20191-4367; phone: 703-264-7200, fax: 703-620-0994; email: standards@npes.org.

**Richard W. Harold** is senior color scientist at GATF and manager of GATF's new Color and Appearance Measurement Laboratory. **David Q. McDowell** is a senior technical associate in the Professional Imaging Division of Eastman Kodak Company. He assisted Tony Johnson in the editing and preparation of the new version of ISO 3664.

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