

Engineering Activities

ASA Standards for Color

American Standard Methods of Measuring and Specifying Color, Z58.7.1-3, 1951, approved April 13, 1951, have been published by the American Standards Association. They consist of three parts, each one numbered differently so that workers concerned with separate phases may refer to each part separately. This Z58.7 set of standards is a revision of War Standard Z44-1942, taken over for revision by the recently formed ASA committee Z58, Sectional Committee on Standardization of Optics, Francis W. Sears, Chairman, sponsored by the Optical Society of America. The revision was handled by a subcommittee of which David L. MacAdam of the Eastman Kodak Co. served as chairman. The three standards are titled as follows:

- Z58.7.1-1951, American Standard Method of Spectrophotometric Measurement for Color;
- Z58.7.2-1951, American Standard Method for Determination of Color Specifications;
- Z58.7.3-1951, American Standard Alternative Methods for Expressing Color Specifications.

The first standard states the scope, then sets up seven provisions that relate to spectrophotometric measurement of color: 1, wavelength range; 2, bandwidth; 3, stray radiant energy; 4, nominal wavelength; 5, photometric scale; 6, spectral reflectance; 7, spectral transmittance. This is followed by a discussion, with nine numbered paragraphs.

The second standard sets up procedures for computing color specifications from spectrophotometric measurements in terms of the well-known and widely used tristimulus values X, Y and Z which are based on values for the equal-energy spectrum (and the "Standard Observer") adopted in 1931 by the International Commission on Illumination (380-780 $m\mu$). Tables of values I.C.I. Standard Source C (380-770 $m\mu$) are included for use both by the weighted ordinate (10- $m\mu$ interval) method and the selected ordinate method of calculation. Trichromatic coordinates (x, y, z) are given for the spectrum (380 to

780 $m\mu$ in 5- $m\mu$ intervals). The usual ICI (x,y)-chromaticity diagram is presented as the American Standard Chromaticity Diagram. All illuminations other than ICI Standard Source C are referred to as "nonstandard," and while it is pointed out that sometimes it may be important to use other sources in computation, the result "should not, however, be designated American Standard."

The third standard establishes alternative methods for expressing color in terms of dominant wavelength, purity and luminance; and secondly, in terms of Munsell hue, Munsell chroma and Munsell "value," "by interpolation in tables and charts prepared by the Subcommittee on the Spacing of the Munsell Colors of the Colorimetry Committee of the Optical Society of America, 1943." It is noted that these two sets of terms specify quantities that correlate more or less satisfactorily with hue, saturation (chroma) and lightness (value), defined as "features of color sensation and perception," but that the Munsell terms correlate somewhat better than dominant wavelength, purity and luminance for opaque, reflecting materials under usual conditions of observation.

There are many things in these standards that need to be studied. In some respects they are wordy and less clear than Z44-1942 which they are intended to replace. In other respects they are an improvement. The limitation they set, * that to comply with American Standard Methods one must do all colorimetric measurement and specification through spectrophotometry, is so extreme and so impracticable, in the opinion of the reviewer, that it will certainly lead to revisions in the standards if they are to become as useful in American practice as they could be. Omission of

*The standards set this limitation, although the Foreword states that any method may be used for sections 1 and 2 that will provide equivalent results. Specific note is made, however, that "This Foreword is not a part of the American Standard Methods...." Either the note is incorrect, so that the Foreword should be a part of the standard, or only specifications arrived at through spectrophotometry comply with the standard methods.

direct and full reference to the internationally adopted resolutions of the 1931 (and other) meetings of the International Commission on Illumination, as the basis for these American Standards, is an omission that is confusing. American acceptance of so much of the ICI recommendations for colorimetric practice is so very general that it would have clarified the meaning of some of the American Standards provisions if more direct reference were made as to those parts adopted, and those parts omitted, of the ICI recommendations. (A typographical error in the heading of the last section of the third standard should be noted: "Deflecting" is written for Reflecting.)

However, the committee has worked long and hard to reach a point of agreement and of ASA approval and publication. Dr. MacAdam served as chairman of the subcommittee, and he had on the committee many members who served as representatives of ASA member-associations, firms, or cooperating governmental organizations. Among them were: Carl

Z. Draves (for the AATCC); I. H. Godlove (for the Ansco division of General Aniline and Film Corp.); S. M. Newhall (for APA); M. Rea Paul (for ASTM); A. J. Werner (alternate for Corning Glass Works); Wm. F. Little (for Electrical Testing Laboratories); Norman F. Barnes (alt. for General Electric Co.); C. L. Crouch (alt. for IES); W. R. Brode (for OSA); Fred E. Altman (for SMPTE); D. B. Judd (for National Bureau of Standards); and E. K. Kaprilian (for Dept. of Army Signal Corps). (Initials have been used for ISCC member-bodies.)

Later it may be useful to publish a critical review of these standards, but at present it seems enough to let all color workers know that we now have available a set of ASA standards for use in measuring and specifying color. Copies of the set of three standards (15 pp.) may be purchased at fifty cents per set direct from the American Standards Association, 70 E. 45th St., New York 17.—D.N. (*Reprinted from I-SCC News Letter No. 94*)

Back Issues of the Journal Available

Three and one-half years of the Journal, July 1947 through December 1950, are available at the job lot price of \$25.00 from Mr. Max Prilik, c/o Circle Theater, 82 H Grant Circle, The Bronx 60, N.Y.

SMPTE Officers and Committees: The roster of Society Officers and the Committee Chairmen and Members were Published in the April *Journal*.

Obituary

Albert L. Raven died on July 11 after a long illness at the age of 75. He was President of the Raven Screen Corp., 124 E. 124th St., New York, which he founded in 1921.

As a young man he had traveled on cruise ships as a photographer for Underwood & Underwood. He also had been employed by the Nicholas Power Co., working with motion picture equipment, before developing and marketing his ideas for motion picture screens. He invented a perforated screen and perfected a "half-tone" screen

with high reflective powers accomplished with a facing of cotton backed by titanium and rubber to get white color and opaqueness. This screen was used by Eastman Kodak Co. for its *Cavalcade of Color* at the New York World's Fair. In the 1930's the Raven Screen Co. boasted "a screen in every house on Broadway." More recently the company has concentrated on screens and related equipment for homes and institutions. Mr. Raven had been a member of this Society since 1924.