



Designation: E 883 – 99

Standard Guide for Reflected-Light Photomicrography¹

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This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This guide outlines various suggested methods which may be followed in the photography of metals and materials with the reflected-light microscope. Methods are included for preparation of prints and transparencies in black-and-white and in color, using both direct rapid and wet processes.

1.2 Descriptive material is provided where necessary to clarify procedures. References are cited where detailed descriptions may be helpful. Guidelines are suggested to yield photomicrographs of typical subjects and, to the extent possible, of atypical subjects as well. Information is included concerning techniques for the enhanced display of specific material features.

1.3 *This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* Specific precautionary statements are given in X1.7.

1.4 The sections appear in the following order:

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2. Referenced Documents

2.1 ASTM Standards:

- E 3 Methods of Preparation of Metallographic Specimens²
- E 7 Terminology Relating to Metallography²

¹ This guide is under the jurisdiction of ASTM Committee E-4 on Metallography and is the direct responsibility of Subcommittee E04.01 on Sampling, Specimen Preparation, and Photography.

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² *Annual Book of ASTM Standards*, Vol 03.01.

E 175 Terminology of Microscopy³

E 768 Practice for Preparing and Evaluating Specimens for Automatic Inclusion Assessment of Steel²

3. Significance and Use

3.1 This guide is useful for determining appropriate conditions for photomicrography of metals (see Methods E 3) and materials with the reflected-light microscope and the subsequent processing of the photographic materials. It is limited to these applications.

4. Magnification

4.1 Photomicrographs shall be made at preferred magnifications, except in those special cases where details of the microstructure are best revealed by unique magnifications.

4.2 The preferred magnifications for general use in making photomicrographs, expressed in linear units, are: 25×, 50×, 75×, 100×, 200×, 250×, 400×, 500×, 750×, 800×, and 1000×.

4.3 Magnifications are normally calibrated using a stage micrometer. When precision calibration is required, a certified stage micrometer shall be used.

5. Reproduction of Photomicrographs

5.1 Photomicrographs submitted for publication shall be enlarged or reduced to the nearest standard magnification, if necessary. A milli- or micrometre marker shall be superimposed on the photomicrograph to indicate magnification, in a contrasting tone. The actual linear magnification of the print shall be stated in the caption.

5.2 Photomicrograph captions should include basic background information (for example, material identification, etchant, mechanical or thermal treatment details) and should briefly describe what is illustrated so that the photomicrograph can stand independent of the text.

5.3 Arrows or other markings, in a contrasting tone, shall be used to designate specific features in a photomicrograph. Any marking used shall be referenced in the caption.

6. Optical Systems

6.1 The microscope objective forms an image of the specimens in a specific plane within the microscope called the

³ *Annual Book of ASTM Standards*, Vol 14.02.