Designation: F601 – 03(Reapproved 2008)

Standard Practice for Fluorescent Penetrant Inspection of Metallic Surgical Implants[1]

This standard is issued under the fixed designation F601; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope*

1.1 This practice is intended as a guide for fluorescent penetrant inspection of metallic surgical implants.

1.2 *This standard does not purport to address all of the safety concerns, 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.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D95 Test Method for Water in Petroleum Products and Bituminous Materials by Distillation

E165 Practice for Liquid Penetrant Examination for General Industry

E433 Reference Photographs for Liquid Penetrant Inspection

2.2 *ASNT Recommended Practice:*[3]

Recommended Practice No. SNT-TC-1A

2.3 *SAE Standard:*[4]

AMS 2644 Inspection Material, Penetrant

3. Significance and Use

3.1 This practice is intended to confirm the method of obtaining and evaluating the fluorescent penetrant indications on metallic surgical implants.

3.2 The product acceptance and rejection criteria will be as agreed upon between the purchaser and the supplier.

4. Fluorescent Penetrant Method

4.1 Perform fluorescent penetrant inspection of metallic surgical implants in accordance with Practice E165, Method A.

4.2 The penetrant system used shall conform to a minimum of Sensitivity Level 3, in accordance with the latest revision of AMS 2644.

4.3 All penetrant materials shall be compatible with each other.

5. Penetrant Method Materials Control

5.1 The penetrant method materials deteriorate in usefulness through contamination and age. The following controls should be used to evaluate the materials' usefulness unless the supplier's requirements are more stringent:

5.1.1 *Penetrants:*

5.1.1.1 *Water Content*—Where there is a possibility of water contamination to penetrant materials, the water content should be determined by Test Method D95. The water content shall not exceed 10 %. The frequency of testing shall be at least once every 30 days for open containers.

5.1.1.2 *Fluorescent Brightness*—Fluorescent brightness should be determined at least once every 30 days or before use by comparison of samples of the working penetrant to a sample of new penetrant under black light. No visible difference shall be allowed.

5.1.2 *Developer:*

5.1.2.1 *Dry*—The developer should be dry and fluffy. Developers showing evidence of fluorescence when compared to new developer shall not be used.

5.1.2.2 *Wet*—A method should be employed to ensure adequate suspension of the wet developer prior to use. The specific gravity of the developer should be from 1.018 to 1.034. This method does not apply to nonaqueous solvent developer due to the volatile nature of the product.

5.1.3 *Black Lights*—Black lights used for fluorescent penetrant inspection should be checked for black light output (with a filter) for a minimum of 800 μW/cm^2 at a distance of 381 mm (15 in.) from the lamp face. This measurement could be determined by using a calibrated black light meter. The frequency of testing shall be at least once every 7 days or before use.

[1] This practice is under the jurisdiction of ASTM Committee F04 on Medical and Surgical Materials and Devices and is the direct responsibility of Subcommittee F04.12 on Metallurgical Materials.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from American Society for Nondestructive Testing (ASNT), P.O. Box 28518, 1711 Arlingate Ln., Columbus, OH 43228-0518, http://www.asnt.org.

[4] Available from Society of Automotive Engineers (SAE), 400 Commonwealth Dr., Warrendale, PA 15096-0001, http://www.sae.org.

***A Summary of Changes section appears at the end of this standard**