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Standard Practice for Preparation of Low-Carbon Steel for Electroplating[1]

This standard is issued under the fixed designation B183; 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.

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

1. Scope

1.1 This practice is intended as an aid to electroplaters in setting up a suitable cleaning cycle preparatory to electroplating of low-carbon steel (Note 1) containing less than 0.35 mass % of carbon and to indicate some of the precautions that must be taken to maintain this cycle in good operating condition.

NOTE 1—The preparation of high-carbon steel for electroplating is covered in Guide B242.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 *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]

B242 Guide for Preparation of High-Carbon Steel for Electroplating

B322 Guide for Cleaning Metals Prior to Electroplating

3. Nature of Cleaning

3.1 The preparation of low-carbon steel for electroplating involves three basic steps in the following order:

3.1.1 Removal of oil, grease, and caked-on dirt,

3.1.2 Removal of scale and oxide films by "pickling," and

3.1.3 Removal of any smut left on the surface after step 3.1.2 and activation of the steel.

3.2 Removal from the steel of fabricating lubricants and finishing compounds may have to be undertaken by "precleaning" before the articles reach the electroplating room. The remainder of the operations should immediately precede the electroplating. In some instances separate removal of smut may not be necessary as in the case of parts which are barrel-electroplated and tumbled.

4. Cleaning Solutions and Apparatus

4.1 All solutions should be subject to chemical control, including determinations of the free acid and iron contents of the pickling solutions and acid dips, and such tests of the cleaning solutions as recommended by the manufacturer.

4.2 Based on tests and experience, all solutions should be discarded before they have lost their effectiveness.

4.3 To conserve cleaning and pickling solutions and to ensure continuous operation when heavy production is involved, doubling of facilities in the same line of operation may be desirable. This arrangement will result in a high degree of contamination of the first of two solutions of the same kind while the second ones will be sufficiently clean to continue to use. It will also reduce the degree of contamination of subsequent solutions, for example, by oil and grease.

4.4 As an alternative to the procedure described in 4.3, the cleaner and pickle tanks may be provided with a large dam overflow and a pump having its intake placed about half-way down the overflow dam between the accumulated grease and oil on top and the settled-out solid dirt at the bottom, and having its outlet placed near the bottom of the tank at the end opposite to the dam overflow.

[1] This practice is under the jurisdiction of ASTM Committee B08 on Metallic and Inorganic Coatingsand is the direct responsibility of Subcommittee B08.02 on Pre Treatment.

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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.