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American Association State Highway and Transportation Officials Standard AASHTO No. M232

Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware[1]

This standard is issued under the fixed designation A 153/A 153M; 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 Department of Defense.

1. Scope

1.1 This specification covers zinc coatings applied by the hot-dip process on iron and steel hardware.

1.2 This specification is intended to be applicable to hardware items that are centrifuged or otherwise handled to remove excess galvanizing bath metal (free zinc). Coating thickness grade requirements reflect this.

1.3 This specification is applicable to orders in either inch-pound units (as A 153) or in SI units (as A 153M). Inch-pound units and SI units are not necessarily exact equivalents. Within the text of this specification and where appropriate, SI units are shown in parentheses. Each system shall be used independently of the other without combining values in any way. In the case of orders in SI units, all testing and inspection shall be done using the metric equivalent of the test or inspection method as appropriate. In the case of orders in SI units, such shall be stated to the galvanizer when the order is placed.

1.4 *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:*

A 90/A 90M Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles[2]

A 143 Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement[2]

A 385 Practice for Providing High-Quality Zinc Coatings (Hot-Dip)[2]

A 780 Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings[2]

B 6 Specification for Zinc (Slab Zinc)[3]

B 487 Test Method for Measurement of Metal and Oxide Coating Thicknesses by Microscopical Examination of a Cross Section[4]

B 602 Test Method for Attribute Sampling of Metallic and Inorganic Coatings[4]

E 376 Practice for Measuring Coating Thickness by Magnetic-Field or Eddy-Current (Electromagnetic) Test Methods[5]

3. Materials and Manufacture

3.1 *Steel or Iron*—Ferrous articles to be hot-dip zinc coated shall conform to specifications designated by the purchaser.

3.2 *Zinc*—The zinc used for the coating shall conform to Specification B 6 and shall be at least equal to the grade designated as "Prime Western."

3.3 *Coating Thickness Grade*—The thickness grades of the coating shall conform to the requirements prescribed in Table 1 for the material category and thickness of material in which the article belongs.

3.4 *Threaded Articles*—The zinc coating on threads shall not be subjected to a cutting, rolling, or finishing-tool operation, unless specifically authorized by the purchaser. In order to meet overtapping allowances, tapping the threads of nuts or tapped holes after galvanizing is not prohibited.

3.5 Bare spots that are found on parts after galvanizing shall be renovated by use of the methods found in Practice A 780 if the following criteria are met. The bare spots shall have an area totalling not more than 1 % of the surface area to be coated excluding threaded areas of the piece and the bare spots shall not include any threaded areas of the piece. The thickness of the repair shall be equal to the surrounding galvanized coating except for repairs made by paints containing zinc dust in which case the thickness of the repair shall be 50 % greater than the thickness of the galvanized coating required for the class of material, but shall not be greater than 4.0 mils (100 µm). Repair thickness measurements shall be made in accordance with Practice A 780. The galvanizer shall make repairs unless

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[2] *Annual Book of ASTM Standards*, Vol 01.06.

[3] *Annual Book of ASTM Standards*, Vol 02.04.

[4] *Annual Book of ASTM Standards*, Vol 02.05.

[5] *Annual Book of ASTM Standards*, Vol 03.03.

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