PLATING, ELECTROLYTIC ZINC-NICKEL, PASSIVATE **WSS-M1P87-B1**

PLATING, ELECTROLYTIC ZINC-NICKEL, PASSIVATE, ORGANIC SEALANT **WSS-M1P87-B2**

PLATING, ELECTROLYTIC ZINC-NICKEL, PASSIVATE, ORGANIC SEALANT, BLACK **WSS-M1P87-B3**

PLATING, ELECTROLYTIC ZINC-NICKEL, PASSIVATE, INORGANIC SEALANT **WSS-M1P87-B4**

PLATING, ELECTROLYTIC ZINC-NICKEL, PASSIVATE, INORGANIC SEALANT, BLACK **WSS-M1P87-B5**

1. SCOPE

These specifications define performance requirements for electrolytically plated, passivated zinc-nickel coatings on ferrous parts (stampings, forgings, castings, etc.), some of which additionally have a topcoat sealant.

2. APPLICATION

These specifications were originally released to define performance requirements for electrolytically plated zinc-nickel coatings where corrosion protection and/or decorative appearance of ferrous surfaces is required. Parts may be rack or barrel plated. Plating bath chemistry (acid or alkaline) should be chosen for best performance in the application.

A passivation treatment, either trivalent chromium or chromium-free, shall be applied to zinc-nickel plated parts to retard the formation of white corrosion products. A thin film passivate will preserve the silver color of the plating or impart a slight blue tint. Thick film passivates give the plating an iridescent or colored appearance.

Sealants are applied to extend the corrosion protection of the plated part. Sealers can be organically or inorganically based, or a mixture of organic and inorganic components. Inorganic sealers will generally resist heat and degradation due to automotive fluids better than organic sealers.

WSS-M1P87-B1 is suitable for underbody or underhood applications which receive minimal road spray, or where parts will subsequently be painted. The passivate prevents white corrosion products from forming during transport from the plating facility to the painting facility. The passivate may not be needed if the parts are painted within a few hours of electroplating.

WSS-M1P87-B2 and –B3, which include an organic sealer, are suitable for underbody or underhood applications where additional corrosion protection is required, and are recommended for use at service temperatures of 150 °C maximum.

WSS-M1P87-B4 and –B5, which include an inorganic sealer, are suitable for underbody or underhood applications where exposure to heat or incidental exposure to automotive fluids is anticipated, and are recommended for use at service temperatures of 250 °C maximum.

Date	Action	Revisions	Rev 01
2017 07 28	Revised	See revision list at end of document	L. Click, FNA
2013 07 18	Released		C. Weber, FNA

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2.1. LIMITATIONS

Not all passivates can be successfully painted, so part trials must be performed to verify adhesion of the paint to passivate. Paint lines with strong alkaline cleaners may remove the passivate which is acceptable if a pretreatment such as zinc phosphate is applied prior to paint. Sealers typically prevent paint from bonding to the surface.

3. REQUIREMENTS

3.1 APPROVED SOURCES

This specification is performance based and does not have approved sources.

3.2 THICKNESS 8 µm, min

(ASTM B659 / ASTM B568 / ASTM B487)

The minimum thickness applies to all significant surfaces as defined in section 4.1 unless otherwise specified on the Engineering Drawing. A maximum plating thickness should be stated on the Engineering Drawing if thick deposits will negatively impact tolerances, functional requirements, assembly, or appearance. In case of dispute, the thickness measurement umpire method shall be metallographic sectioning per ASTM B 487.

The passivate and sealant layers are not subject to measurement, but shall be sufficient to meet the Appearance and Laboratory Accelerated Corrosion Test requirements.

3.3 APPEARANCE

WSS-M1P87-B1: Parts may be blue-bright or show a slight iridescence. When dyes are used to produce other colors, the color shall be stated on the Engineering Drawing.

WSS-M1P87-B2, B4: Parts naturally show a slight iridescence. When dyes are used to produce other colors, the color shall be stated on the Engineering Drawing.

WSS-M1P87-B3, B5: Parts will be black.

3.4 COMPOSITION

(ASTM B568)

The zinc-nickel plating shall have a nickel content of 12 to 16 weight percent, with the balance zinc. The plating shall be a uniform, homogeneous alloy of zinc and nickel throughout the thickness of the deposit and across the high and low current densities of the part.

Chemical composition of the coating may be determined by any applicable test method. With proper calibration, x-ray fluorescence (XRF) spectroscopy can be used to determine the coating composition and thickness simultaneously. In case of dispute, atomic absorption (AA), directly-coupled plasma (DCP) or inductively-coupled plasma (ICP) spectroscopy using known standards shall be used as umpire methods.

Zinc-nickel alloy is the only deposit to be applied directly to the base. The use of a zinc strike is not permitted.

3.5 PLATING ADHESION

(ASTM B571)

The coating shall withstand normal handling, storage, and installation without flaking or peeling or other loss of adhesion. Electroplate adhesion to the base metal shall conform to the requirements of one of the following test methods per ASTM B571 unless otherwise indicated on the Engineering Drawing.

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