Ford Motor Company

ENGINEERING MATERIAL SPECIFICATION

Material Name	Specification Number
CORROSION PROTECTIVE COATING, ELECTROLYTIC ZINC PLATE, TRIVALENT CHROMATE, LUBRICATED ALUMINUM-RICH ORGANIC TOPCOAT, SILVER	**WSS-M21P40-A1**
CORROSION PROTECTIVE COATING, MECHANICAL ZINC PLATE, TRIVALENT CHROMATE, LUBRICATED ALUMINUM-RICH ORGANIC TOPCOAT, SILVER	**WSS-M21P40-A2**

1. SCOPE

The materials defined by these specifications are corrosion protective coatings over steel. They consist of an electrolytic or mechanical zinc plate, a hexavalent chromium free conversion coating, and an integrally lubricated aluminum-rich topcoat. This coating system provides enhanced corrosion protection, color and/or consistent torque-tension control.

They are free of hexavalent chromium, nickel, lead and cadmium.

2. APPLICATION

These specifications were released originally for materials used for corrosion protective coatings over steel. They are suitable for externally and internally threaded fasteners and non-threaded parts where a high level of corrosion is required. The cure temperature for the aluminum rich topcoat is 200 to 220 °C.

These coatings shall not be specified if this temperature adversely affects the component being coated. These coatings provide good bi-metallic corrosion resistance when in contact with aluminum. They should not be applied to parts in contact with uncoated copper, magnesium or stainless steel surfaces.

2.1 SERVICE TEMPERATURE

The maximum continuous service temperature resistance of A1 and A2 is 260 °C.

3. REQUIREMENTS

3.1 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

Material suppliers and part producers must conform to the Company's Standard Requirements For Production Materials (WSS-M99P1111-A).

Date	Action	Revisions
2002 06 11	Activated	D. Drobnich

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3.2 LICENSEE APPLICATOR QUALITY REQUIREMENTS

Applicators must follow coating manufacturer procedures and recommendations for chemical usage, equipment and processing.

3.3 MATERIAL PERFORMANCE

3.3.1 Raw Material Storage Stability

The material must be capable of being stored at 23 +/- 2 °C for 60 days without detrimental effect to the performance of the coated parts.

3.3.2 Cleaning

Prior to coating, the parts shall be free of oil, scale, and similar foreign materials. The cleaning process shall have no detrimental effect on the substrate, including freedom from embrittlement.

3.3.3 Curing

The topcoat is typically cured at 200 to 220 °C and shall not be used on materials that are adversely affected by these material temperatures. Parts must be sufficiently cured at the time of packing to withstand normal handling and shipping without marring.

3.3.4 Finished Condition

Parts must be dry to touch such that, when held with a Watman's No.41 filter paper, or equivalent, and applying hand pressure for 5 to 10 seconds, there shall be no visible staining of the filter paper when viewed without using supplementary magnification. For referee purposes this test shall be carried out using a force of 10N.

3.3.5 Appearance

The coating shall be uniform in color and free from discontinuities when viewed without magnification.

3.3.6 Storage Life

Parts supplied shall still meet the specific requirements of this specification 6 months after receipt by Ford when stored at 5 to 28 °C with no direct heat or sunlight.

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