



CORROSION PROTECTIVE COATING, ORGANIC POLYMER, FRICTION-MODIFIED

WSS-M21P28-A2

1. SCOPE

This specification defines the material and performance criteria of a corrosion-protective and torque-tension enhancing coating consisting of an organic water-borne top coat applied to zinc phosphated ferrous parts.

2. APPLICATION

This specification was originally released as an economical corrosion-protective coating upgrade for fasteners and small parts in chassis exterior applications where a phosphate and oil finish was previously used. It is not intended for body interior applications, high temperature applications, applications in direct contact with plastics, applications directly exposed to solvents, or areas of high visibility.

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).

3.2 ZINC PHOSPHATE SUBSTRATE (FLTM AQ 101-03)

Metal surfaces to be phosphated must be free of soil, grease, rust, and scale. The zinc phosphate substrate shall have a smooth, compact, macrocrystalline structure which forms a dense, uniform coating, free from voids. A minimum phosphate coating weight of 32.3 g/m², as deposited on a steel panel processed through the production line, is required to maintain good overall performance of the coating.

3.3 SEAL TREATMENT

A chrome free final seal treatment may be applied to the phosphated surface prior to the topcoat.

3.4 TOP COAT THICKNESS

A specific top coat thickness is not specified. The minimum thickness shall be sufficient to meet the corrosion resistance requirements. A typical film build which exhibits the appropriate corrosion resistance and torque-tension characteristics is approximately 12.5 micrometers in thickness. Excessive coating thickness on threaded components may cause assembly concerns. The general requirements of the Ford Worldwide Fastener Standards, Finish Specification WX 100, Section 5 apply to this coating.

Date	Action	Revisions	Rev. 04
2014 05 14	Re-Activate	Coating is still used for U bolt applications	G. Weber, NA
2012 12 04	N Status	Replaced by WSD-M21P11-B2	G. Weber, NA
1998 07 29	Activated		D. Drobniak



3.5 APPEARANCE

The coating shall be black in color and have a uniform semi-gloss appearance. The parts must be dry to the touch such that when held with a Watman's No. 41 filter paper, or equivalent, and applying hand pressure for 5 - 10 seconds, there shall be no visible staining of the filter paper when viewed without using supplementary magnification. For referee purpose, this test shall be carried out by using a force of 10 N.

3.6 CORROSION RESISTANCE (SAE/USCAR-1)

24 h min

Parts tested for 120 hours shall exhibit less than 5% ferrous corrosion of the base metal on significant surfaces. To evaluate base metal corrosion, parts may be lightly brushed to remove any staining that may have occurred. At its option, Ford Engineering will periodically process parts finished to this specification at the Arizona Proving Ground or equivalent test facility to assess corrosion resistance.

4. GENERAL INFORMATION

The information given below is provided for clarification and assistance in meeting the requirements of this specification. Contact gmfs@ford.com for questions concerning Engineering Material Specifications.

4.1 ADHESIVE OR SEALER COMPOUNDS

The application of adhesive or sealer compounds to threaded fasteners shall be done after the coating process. The applicator of the adhesive or sealer compound shall be responsible for assuring compliance to all performance requirements of the specified compound.

4.2 POLYAMIDE OR FLUOROCARBON COMPOUNDS

The application of polyamide or fluorocarbon compounds to threaded fasteners shall be done after phosphating and prior to the topcoat. The applicator of the polyamide or fluorocarbon compound shall be responsible for assuring compliance to all performance requirements of the specified compound.