



PHOSPHATE COATING, MANGANESE, MICRO CRYSTALLINE

WSD-M3P33-A2

1. SCOPE

This specification defines fine grain Manganese Phosphate coatings.

2. APPLICATION

This specification was released originally for coatings that will provide a reduction in wear during the initial break-in period, and are not intended for anti-corrosion or fastener applications. However, parts coated according to this specification may be oiled to prevent corrosion during shipment (see paragraph 3.6).

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 PHOSPHATING PROCESS

It is not intended to specify or limit the process details. Suppliers shall ensure that all the operations including pre-cleaning, rinsing, phosphating, rinsing and post treatments are suitable to produce a coating that fully meets the requirements of the specification. The process and component test procedure shall form part of the Control Plan and if applicable, the relevant Manufacturing Process Standard will be specified on the Engineering Drawing.

3.3 CRYSTAL SIZE AND APPEARANCE (ASTM E 112)

The coating shall be evenly deposited and complete, and shall have a fine grained uniform microcrystalline structure.

Manganese Phosphate

Size 9 or finer
Or 16 μm max

Measurement shall be made using a suitable microscope. Scanning Electron Microscope recommended or an optical microscope.

3.4 COATING WEIGHT (Measured on completely covered sample) (FLTM AQ 101-01 or FLTM AQ 101-03 or ISO 3892 (method/frequency to be part of the Control Plan))

Coating Weight

7.5 to 15 g/m^2

Date	Action	Revisions	Rev 03
2014 09 10	Revised	See Summary of Revisions	S. Ryzyi, NA
2008 04 11	Re-Activated	WSD-M3P33-A2, took WSD-M3P33-A1 off the specification, that is still inactive	
1990 02 22	Released	C10060477	G. Lane, N. Riley, E. A. T. Graham, NAAQ



3.5 COATING THICKNESS (APPARENT)

The phosphating process has a dimensional influence on the component proportional to the actual phosphate thickness. In those instances when, for reasons of fit etc., dimensions are critical after phosphating, appropriate controls shall be included on the Engineering Drawing.

Direct phosphate thickness measurement is difficult (ref. para 4.1).

3.6 CORROSION PROTECTION

By agreement between Ford and the supplier, parts phosphated in accordance with this specification may be oiled to provide short-term rust protection during shipment.

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 COATING THICKNESS

For the coating weights specified, coating thicknesses expected are nominally 0.002 to 0.006 mm. and dimensional change of the component in this order should be expected.

Actual thickness is dependent upon prior cleaning, crystal morphology, base material, process parameters, and method of measurement.

5. SUMMARY OF REVISIONS

2014 09 10

- Revised title from Manganese Iron to Manganese
- Added crystal size requirement
- Added coating weight test method