SES 26 - 775.

MANGANESE/NICKEL PHOSPHATE COATING FOR CARBON AND LOW ALLOY STEEL PARTS TO DECREASE FRICTION AND GALLING (As per FMC)

Rev	Reason of Change	Date	Made By	Reviewed By	Approved By	Status
0		24-07-2014	KKM	AMIT S	KKD	Released

Summary:

This specification defines the requirements for a manganese/nickel phosphate coating with a corrosion and wear protecting oil dip.

COATINGS MAY NOT BE USED TO IMPROVE THE MATERIAL CLASS OF THE BASE MATERIAL. THIS SPECIFICATION DOES NOT APPLY TO STAINLESS STEEL. MAY BE USED IN CO_2 < 30 PSI (2 BAR) PARTIAL PRESSURE ONLY.

MANGANESE/NICKEL PHOSPHATE COATING FOR CARBON AND LOW ALLOY STEEL PARTS TO DECREASE FRICTION AND GALLING (As per FMC)

1.0 SCOPE

1.1 This specification defines the requirements for a manganese/nickel phosphate coating with a corrosion and wear protecting oil dip.

1.2 This specification applies to carbon and low alloy steels only and does not apply to stainless steels. For chromium-molybdenum low alloy steels, such as F22, this specification shall not be used and instead Zinc phosphate may be considered.

1.3 This specification applies when the "as coated" properties of the coating are acceptable.

2.0 DESCRIPTION AND GENERAL REQUIREMENTS

2.1 All parts must be coated and areas protected as specified on the part engineering drawings.

2.2 The coating system shall comply with section 6.0, and the vendor must be approved on the Sara QSL (Qualified Supplier List). Alternate products may be used upon review and approval by Sara Engineering.

2.3 Unless otherwise specified in this document, all products involved in the application of this coating system shall be used in accordance with their **respective manufacturer's technical and safety data sheets.**

3.0 VENDOR COATING REQUIREMENTS

3.1 Each part to be coated shall be cleaned by chemical methods for removal of grease and oil to avoid poor adhesion of the coating to the substrate. Surface cleaning shall be in accordance with SSPC-SP 1 for solvent cleaning.

3.1.1 SSPC-SP 1 allows for one or more of the following cleaning operations to ensure proper surface condition before coating. These processes must not impair machined surfaces.

- A commercial, non-caustic alkaline cleaner shall be used to remove water soluble lubricants from parts.

- Degrease with a non-ozone depleting cleaning solvent in a conventional vapor degreasing apparatus to remove non-water soluble lubricants.

The requirement for cleanliness is no water breaks. This shall be determined by pouring water on the part surface. If the water beads up, then oil or grease remains on the surface and it is not cleaned. Additional cleaning shall then be performed as described in 3.1.1 until the requirement of no water breaks is met. If the water spreads on the surface, then the oil and grease have been removed.

3.2 Blast cleaning shall be performed following chemical cleaning unless stated otherwise on the part engineering drawings. All seal surfaces and surfaces ≤ 32 RMS shall NOT be grit blasted, unless otherwise specified on the part drawings.

3.2.1 Surfaces not to be coated shall be masked with a suitable material prior to grit blast cleaning. Nonfunctional surfaces may be coated provided such coating is more economical than masking and prior approval from Sara Engineering is obtained. Otherwise, no overspray is allowed.

3.2.2 Except for seal surfaces, parts shall be grit blast cleaned before coating by any non-interfering abrasive. Aluminum oxide grit is an example of an acceptable abrasive. All coating substrates shall be blast cleaned to a white metal finish in accordance with NACE #1, SSPC-SP 5, or ISO 8501 – Sa 3 with a 0.3 to 0.8 mil (8 to 20 microns) anchor pattern. Surface finishes better than 125 RMS must be maintained, unless otherwise specified on the part drawing.

3.2.3 After removing the masking, clean parts with compressed air and a suitable brush to dislodge all grit media. Compressed air shall be free of any oil/water as identified by ASTM D4285.

3.2.4 Parts shall be protected between blasting and coating processes from exposure to any foreign contaminants/oils. All operators handling blasted parts shall wear clean, oil-free gloves. Any coating surface which exhibits rust, oxidation, or discoloration shall be re-blasted prior to coating application.

3.3 Coat: Apply manganese/nickel phosphate coating by immersion to achieve a phosphate density of 2000 to 3500 mg/ft^2 (22 to 38 g/m^2). All solution and application parameters shall be in accordance with manufacturer's technical data sheet. Rinse with cold clean water. Acceptable manganese/nickel phosphate materials are Aerocote 4 or Keykote 40.

SARA SAE PRIVATE LIMITED DIVISION-I SUBHASH NAGAR, DEHRADUN

3.4 Passivate: Apply a commercially available phosphate passivator/sealing rinse product by dip or spray method in accordance with the manufacturer's technical data sheet.

3.5 Oil Finish: Apply Aeroguard PR-303 onto phosphated surface by dip or spray application in accordance with the manufacturer's technical data sheet. Alternate oil finish materials may be used with review and approval by Sara Engineering.

4.0 THICKNESS AND COLOR

4.1 Total Coating Thickness: The coating weight is to be no less than 2000 mg/ft^2 (22 g/m^2). While there may be no tolerance change, maximum thickness is not to exceed 0.6 mils (15 µm).

4.2 Color: May vary from gray to black.

5.0 COATING INSPECTION

5.1 Visually inspect all parts for coating uniformity.

6.0 ACCEPTABLE COATING SYSTEMS

Manganese/Nickel Phosphate	Passivator	Oil Finish
Aerocote 4	Commercially available phosphate passivator / sealing rinse	Aeroguard PR-303
Keykote 40		

*** END OF DOCUMENT ***