



## PHOSPHATE SOLUTION, MANGANESE, MAKE-UP

WSS-M5B424-A

**1. SCOPE**

The material defined by this specification is an aqueous solution containing manganese for ferrous materials phosphate bath.

**2. APPLICATION**

This specification was released originally for South America for material used as manganese iron phosphate coating for gear box, with no Hexavalent Chromium (Cr+6), that will provide a reduction in wear during the initial breaking-in period, and is not intended for anticorrosion or fastener applications. However, parts coated according to this specification may be oiled to prevent corrosion during shipment.

**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 CHEMICAL COMPOSITION**

Supplier must maintain the following characteristics to a maximum tolerance as reported with the initial sample. All other essential components must be reported with the initial sample and maintained as part of the Control Plan.

|                                                                                                 |                |
|-------------------------------------------------------------------------------------------------|----------------|
| Manganese                                                                                       | 5.65 +/- 0.45% |
| (using 0.01M Ethylenediamine tetracetic acid solution, eriochrome black and MgSO <sub>4</sub> ) |                |

**3.3 ACIDITY**

|                                                            |                |
|------------------------------------------------------------|----------------|
| Free (Sodium hydroxide 0.1N)<br>Indicator: Dimethyl yellow | 3.6 +/- 0.2 mL |
|------------------------------------------------------------|----------------|

|                                                             |             |
|-------------------------------------------------------------|-------------|
| Total (Sodium hydroxide 0.1N)<br>Indicator: Phenolphthalein | 22 +/- 1 mL |
|-------------------------------------------------------------|-------------|

**3.4 PHYSICO-CHEMICAL PROPERTIES**

|                                |                    |
|--------------------------------|--------------------|
| Color (visual)                 | Green              |
| Aspect (visual)                | Liquid             |
| Density at 25 °C (ASTM D 1475) | 1.27 +/- 0.02 g/mL |

| Date       | Action    | Revisions |
|------------|-----------|-----------|
|            |           |           |
|            |           |           |
| 2007 11 07 | Activated |           |



Documents

J. Rodrigues

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### 3.5 RESISTANCE PROPERTIES

The material defined by this specification must be used with a phosphate system and in conjunction with the phosphate system must meet the requirements of WSS-M3P37-A.

### 3.6 MATERIAL COMPATIBILITY

The material must be compatible with all related materials in the process, i.e., metal parts, degreases and protective oils. The supplier of this material shall keep abreast of changes in technology of related materials which may affect the compatibility and performance of this product. The supplier shall notify the appropriate Ford Product Materials Engineering Office in writing when incompatibility is anticipated.

### 3.7 QUALITY CONTROL

A quality control plan must be agreed with Ford Product Materials Engineering as part of approval process.

## 4. GENERAL INFORMATION

The information given below is provided for clarification and assistance in meeting the requirements of this specification. The scope of batch release report should be agreed with materials engineering.