

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)		NUMBER: MPAPS GT-24
		Former Designation: CEMS GT-24
TITLE: Phosphate System Compatibility	CURRENT REV No.: 1510	DATE: OCT. 2015
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<i>This specification may involve hazardous materials, equipment, and procedures. This specification does not purport to address all of the safety issues associated with its use. The user is responsible to consult appropriate safety and health practices and to determine the applicability of regulatory limits prior to use.</i>		
Change Notice: Updated to new format, editorial changes		

1.0 APPLICATION

This is a method for determining the effect of contaminants (mill oils, drawing compounds, corrosion preventatives, adhesives, sealers, etc.) on the cleaning stages of the phosphate coating system and on the phosphate coating developed by the system.

2.0 SCOPE

This specification covers test methods for high volume contaminants, low volume contaminants, and adhesives and sealers.

2.1 Restricted Chemical Substances

Effective January 1, 2007, all product supplied to the requirements of this specification must comply with the requirements of the MPAPS B-50 specification.

3.0 REFERENCE DOCUMENTS

Unless otherwise specified, the latest issue of all referenced standards shall apply. The following Specifications, Standards, and Regulations are referenced in this specification.

Quality System Standard ISO 9001 or TS-16949
 CFR Title 29, Part 1910
 NAVISTAR MPAPS B-50
 NAVISTAR MPAPS G-5
 NAVISTAR MPAPS GT-Paint
 NAVISTAR MPAPS P-9543

4.0 APPARATUS

1. A water bath with capabilities of both heating and agitation suitable to simulate the cleaning stage(s) of the phosphate coating system.
2. Draw bars capable of leaving 0.014 mm (0.54 mil) and 0.019 mm (0.75 mil) wet films - RDS Specialties Rods #6 & #8 or equivalent, P.O. Box 206, Webster, NY 14580.
3. Panel test cabinet (containing spray heads and controls).
4. Oven capable of 50°C (120°F).
5. Bottles, 250 ml (8 oz.) capacity.
6. Rack capable of holding test panels vertically with a 25 mm (1 in) space between panels.

5.0 MATERIAL

1. 100 x 200 mm (4 x 8 in) panels of clean cold rolled steel, G-60 galvanized steel (or equivalent EG steel) and 5052-H32 aluminum (16 panels minimum for each metal substrate.)
2. Control oils.

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HIGH VOLUME CONTAMINANTS

High volume contaminants include, but are not limited to, lubricants used during the stamping process.

Panel Preparation

For each metal substrate (CR steel, galvanized steel, 5052-H32 aluminum) to be used in the processing lubricant evaluation:

1. Coat four control panels with a control oil as prescribed in the material specification for the control oil.
2. Coat twelve test panels as prescribed in the material specifications for the processing lubricant to be tested.
3. Load the panels vertically in the rack with a minimum spacing of 25 mm (1 inch) between panels.
4. Age the samples in an oven at 50°C (120°F) for one week (168 hours.)

Procedure

1. Prepare four different concentrations of the phosphate system cleaning solution by adding the concentrated cleaner to clean, distilled or deionized water at concentration levels of 0.25, 0.50, 1.0, and 2.0 oz. per gallon of water.
2. Pour 200 ml of the prepared cleaning solution at each concentration level into four 250 ml glass bottles and warm the solution to 63°C (145°F).
3. Add 4 ml of the test material (processing lubricant) to each bottle and holding the stoppered bottle vertically, agitate vigorously for 10 seconds.
4. Record the percent of separation between the lubricant and cleaning solution for each concentration level at 5 minute, 60 minute, and 24 hour intervals.
5. Note the level of foaming in the tank.
6. Run four (aged) test panels and four (aged) control panels for each metal substrate in the cleaning stage bath (with no contaminants) at the operating temperature and cleaning solution concentration recommended for that bath.
7. Rinse the panels in tap water and estimate the percent of water break-free (% WBF) on the coated side of the panel after rinsing. Record the % WBF.
8. Add 0.10%, by weight, of the test material (processing lubricant) to the bath.
9. Record the change in level of foaming in the tank.
10. Run 4 (aged) test panels (for each metal) in the contaminated bath and rate % WBF after rinsing in tap water.
11. Add an additional 0.15%, by weight, of the test material (processing lubricant) to the bath (0.10% + 0.15% = 0.25%).
12. Record the change in amount of foaming in the tank.
13. Run four aged test panels (for each metal) in the contaminated bath and record % WBF after rinsing.
14. Treat all the panels from the % WBF test (16 panels for each metal, i.e., CR steel, galvanized steel, 5182 aluminum) in an approved phosphate bath using standard time and temperature recommended for that bath.
15. Determine the phosphate coating weight in accordance with MPAPS GT-Paint, method 23 on one panel from each group.
16. Use a scanning electron microscope (SEM) to describe the general appearance of the phosphate coating on the remaining three panels of each group. (See example in the Sample Report).

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17. Prepare the remaining three panels for each group for painting as prescribed in MPAPS GT-Paint, Panel Preparation, Method A. Paint the panels with primer (complete panel) and topcoat; only the bottom half of each panel is to be topcoated. Use Grade 56 primer and Grade 18 topcoat as per MPAPS G-5.
18. Determine the paint adhesion on both the primer and topcoat on one panel from each group in accordance with the method described in MPAPS GT-Paint, method 5A.
19. Perform a humidity test in accordance with MPAPS GT-Paint, method 7E on one panel from each group.
20. Perform a salt spray test in accordance with MPAPS GT-Paint, method 7D on one panel from each group.

Report

Report the following information:

1. The percent of processing lubricant and water separation at 5 minute, 60 minute, and 24 hour intervals.
2. The percent of water break-free (% WBF) for each metal at each contaminant level and that of the controls.
3. The change in amount of foaming at each contaminant level.
4. The phosphate coating weight and coating appearance for each control and test panel of each metal at each contaminant level.
5. The minimum percent adhesion observed on each control and test panel of each metal for each of the contaminant levels.
6. Humidity test results for each control and test panel of each metal for each of the contaminant levels.
7. Salt spray test results for each control and test panel of each metal for each of the contaminant levels.

LOW VOLUME CONTAMINANTS

Low volume contaminants include but are not limited to miscellaneous lubricants and solvents used to maintain the phosphate system.

Panel Preparation

For each metal substrate (CR steel, galvanized steel, 5052-H32 aluminum) to be used in the processing lubricant evaluation:

1. Prepare 4 control panels and 12 test panels for each metal as described High Volume Contaminants, preparation, steps 1 thru 3.
2. Allow the specimens to equilibrate at atmospheric conditions for 2 hrs. prior to testing.

Procedure

1. Test for cleanability as described in High Volume Contaminants, procedure, steps 6 thru 13.
2. Test for phosphatability as described in High Volume Contaminants, procedure, steps 14 thru 15.

Report

1. The percent of water break-free (%WBF) for each metal at each contaminant level and that of the controls.
2. The phosphate coating weight and coating appearance for each control and test panel of each metal at each contaminant level.

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