

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)		NUMBER: MPAPS G-4518
		Former Designation: TMS-4518
TITLE: Corrosion Protective Coatings for Fasteners		CURRENT REV No.: 1404
		DATE: APRIL 2014
WRITTEN/EDITED BY: Materials Engineering	APPROVED BY: Materials Engineering	SUPERSEDES: TMS-4518 - Aug. 2013
PRINTED COPIES OF THIS DOCUMENT MUST BE VERIFIED FOR CURRENT REVISION		
<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: Changed to new MPAPS format; editorial changes.		

1.0 APPLICATION

This specification covers the requirements for a silvery colored, corrosion protective coating consisting of a zinc phosphate conversion coating, covered by a zinc-rich basecoat, and an integrally lubricated aluminum-rich topcoat. **This coating system is free of both hexavalent and trivalent chromium.** These finishes are intended for use on ferrous fasteners and clips where high levels of corrosion protection and freedom from hydrogen embrittlement are required (such as high hardness parts). This coating should not be used on parts which will come in contact with uncoated copper, magnesium, or stainless steel, but will provide good bi-metallic corrosion resistance when in contact with aluminum. Coating should not be used on materials which might be adversely affected by the cure temperature range of 200-255°C (392-491°F). The maximum continuous service temperature is 260°C (500°F).

Two types of coatings are included:

Type I – silver color; for use on externally or internally threaded fasteners M6 and larger and other small parts such as spring clips, brackets, etc.; 840 hours minimum salt spray to red rust.

Type II – silver color; for use on internally threaded parts M6 and larger (e.g., nuts); 480 hour minimum salt spray to red rust.

2.0 SCOPE

This specification covers the general coating process, coating performance and fastener torque-tension requirements, quality, KCC, source approval and quality control, packing, shipping, and identification requirements, and designation on drawings.

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 standards, specifications and regulations are referenced in this specification.

This document is restricted and may not be sent outside Navistar, Inc. or reproduced without permission from Corporate Technical Standards. Suppliers are required to assume all patent liability. ©2014 by Navistar, Inc.

APRIL 2014



Documents

Page 1 of 4
Document Sharing Hub

NUMBER: MPAPS G-4518	TITLE: Corrosion Protective Coatings for Fasteners	REVISION: 1404
---------------------------------------	---	---------------------------------

Quality System Standard *ISO 9001 or TS-16949*
 CFR Title 29, Part 1910
 NAVISTAR Engr. Design Standard A-16
 NAVISTAR Mfg Std MS-D-13

ASTM B 117
 MPAPS B-50
 ASTM G154

SAE J2334
 SAE/USCAR-11

4.0 GENERAL REQUIREMENTS

4.1 Coating Requirements

4.1.1 Zinc-Phosphate Treatment

A zinc phosphate coating shall be applied to the pre-cleaned steel substrate. The phosphate coating shall be sealed, uniformly dense over the entire surface and exhibit a thickness equivalent to a coating weight of 2-13 g/m².

4.1.2 Basecoat

The basecoat for both Types I and II consists of an inorganic zinc-rich layer, having minimum thickness of 7 µm (or coating weight of 24 g/m² min). Typical thickness will be 7-10 µm. The basecoat is oven baked after application at 200-255°C (392-491°F).

4.1.3 Topcoat

The topcoat for both Types I and II consists of an organic aluminum-rich layer, having minimum thickness of 5 µm (or coating weight of 8 g/m² min). Typical thickness will be 5-8 µm. The Type I product uses a higher percentage of aluminum in the coating. The topcoat is oven baked after application at 180-220°C (356-428°F). The topcoat includes an integrated friction modifier to eliminate the need for sealers or post-coating lubricants.

4.1.4. Maximum Thickness on Threads

The coatings will have no adverse effects upon production assembly and disassembly practices. The maximum thickness on threads is limited by the basic thread size and tolerances. After coating, the parts must pass the appropriate thread GO gages without sticking or binding. An evaluation of coating thickness on threads will be included in the Quality Control Plan for each part.

4.1.5 Appearance

Parts shall have a uniform silvery appearance, be thoroughly cured, and free from runs and sags. The coating shall not be oily or tacky to the touch.

4.2 Part Performance

4.2.1 Adhesion (Humidity Testing)

4.2.1.1 Method

Parts shall be tested for 100 hours min in 100% RH at 38°C (100°F), after 72 hours minimum aging at room temperature. Alternatively, parts may be heated to 120 °C (248 °F) for 60 minutes.

4.2.1.2 Requirement

Parts shall show no evidence of blistering, flaking, peeling, or appearance changes. Test panels coated per this specification, or parts suitable for tape testing, shall show no more than 3.0 mm (0.12 in) peel back from intersection of two lines (angle of 25° ± 5° degrees) scribed and tape tested after a 10 minute recovery period following humidity exposure.

4.2.2 Flexibility

Coating shall withstand normal handling and storage conditions without chipping and shall be capable of withstanding the normal extension and compression of springs and normal flexing of parts such as spring clips during assembly without loss of adhesion.

This document is restricted and may not be sent outside Navistar, Inc. or reproduced without permission from Corporate Technical Standards. Suppliers are required to assume all patent liability. ©2014 by Navistar, Inc.

APRIL 2014



Documents

Page 2 of 4
 Document Sharing Hub