

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)		NUMBER: MPAPS- G-4520
		Former Designation: TMS-4520
TITLE: Black Corrosion-Resistant Zinc-Aluminum Coating		CURRENT REV No.: 1604
		DATE: April 2016
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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: Released as MPAPS		

1.0 APPLICATION

This specification covers the requirements for a black, corrosion resistant, non-electrolytically applied, water-based coating for steel substrates. The coating is heat-converted from an aqueous dispersion of zinc and aluminum flakes, and contains a PTFE lubricant dispersed throughout the topcoat. **This coating system is free of both hexavalent and trivalent chromium**, and is suitable for high hardness parts since hydrogen embrittlement is not induced by the process. This type of coating is intended for fasteners size M6 and larger, for exterior applications, as well as small steel clips, brackets, etc., requiring good corrosion resistance. It is not intended for use on internal recessed drive fasteners. 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 a cure temperature range of 288-315°C (550-600°F). The maximum continuous service temperature is 180°C (350°F).

2.0 SCOPE

This specification covers the general coating requirements, 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.

Quality System Standard <i>ISO 9001 or TS-16949</i>	ASTM B 117
NAVISTAR Engr. Design Standard A-16	ASTM D 610
NAVISTAR Manufacturing Standard MS-D-13	SAE J2334
NAVISTAR MPAPS B-50	SAE/USCAR-11
CFR Title 29, Part 1910	

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4.0 GENERAL REQUIREMENTS

4.1 Coating Requirements

4.1.1 Appearance

Coated parts shall have a uniform black appearance, and be free from runs, sags, cracks, pores/blisters, and rough spots. The coating shall not be oily or tacky to the touch.

4.1.2 Thickness

The coating will consist of a 2-layer basecoat (6-10 μm min. thickness or 24 g/m^2 min. coating weight), followed by a 2-layer topcoat (4-6 μm min. thickness or 8 g/m^2 min. coating weight). The total coating thickness will typically be 10-16 μm (32 g/m^2 coating weight), adequate to meet corrosion performance requirements. The coating shall not have an adverse effect on production assembly and disassembly practices. 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.

4.2 Part Performance

4.2.1 Adhesion

After curing, coated parts shall show no flaking, peeling, or loss of adhesion with normal handling. Parts shall show no evidence of blistering, flaking, peeling, or appearance changes, after heating coated parts to 120°C for 60 minutes.

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.

4.2.3 Corrosion Resistance

Coated parts shall be subjected to corrosion testing in neutral salt spray per ASTM B117 and/or cyclic corrosion testing per SAE J2334. Tested parts shall be evaluated per ASTM D 610, Grade 6 or better, and be free of corrosion product after testing per the following schedule:

Salt spray testing		Cyclic corrosion testing	
White corrosion	Red rust	White corrosion	Red rust
240 hr	1008 hr	20 cycles	60 cycles

Threaded parts shall be evaluated on areas other than the threaded portion.

4.2.4 Torque – Tension Requirement

4.2.4.1 Method SAE/USCAR 11

Control parts (7/16 x 20 UNF – or M10 x 1.5 bolts) shall be processed along with each production lot of parts being coated.

4.2.4.2 Required: The control parts will be tested to ensure that the torque values meet the required value of 48 ± 10 Nm to develop a tension of 28.3 kN. Tightening speed shall be 30 ± 3 RPM.

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