

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)		NUMBER: MPAPS G-22
		Former Designation: CEMS G-22
TITLE: Zinc-Nickel Plating		CURRENT REV No.: 1710
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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>		

1.0 APPLICATION

Zinc-nickel plating is used primarily for corrosion resistance of ferrous metal parts (fasteners, fittings, clips, brackets, etc.) where levels of corrosion resistance greater than standard zinc plating are required. The alkaline zinc-nickel plating process (rather than acid zinc-nickel plating) is preferred for parts supplied to this specification, since it provides better coating ductility, minimal flaking, and higher corrosion resistance. A trivalent chromium passivate will be applied to the zinc-nickel plating. Supplementary sealers/topcoats may be applied, depending on the specified plating class and performance requirements. Plated parts should not come in contact with stressed polyamides 6 or 66, due to the potential for stress cracking in the presence of road salts. The service temperature range of zinc-nickel plated parts is -50 to 120°C (-58 to 248°F). This coating is not intended for electrical grounding applications- See MPAPS G-23.

2.0 SCOPE

This specification covers the Corporation's requirements for hex-chrome-free zinc-nickel plating on steel substrates.

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 ISO 9001 or TS-16949	ASTM B 117	ASTM B 499
NAVISTAR Supplier Packing and Shipping Std. D-13	ASTM B 201	ASTM D 6492
CFR Title 29, Part 1910	ASTM B 487	SAE/USCAR-11
NAVISTAR MPAPS GT-31	MPAPS B-50	ASTM D 523
SAE/USCAR-7	MPAPS G-23	ASTM B 659

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4.0 REQUIREMENTS

This specification covers zinc-nickel coatings on ferrous metal substrates. The coating composition is essentially zinc, with 5-15% nickel by weight (Type A) or 10-17% nickel (Type B) (for alkaline plating). Type B coating provides higher corrosion performance than Type A. All required base metal heat treatments and forming/bending operations will be completed prior to performance of the coating operation. Uncoated parts will be thoroughly cleaned and free from rust, scale, oil and other foreign matter detrimental to the quality and performance of the zinc-nickel coating. Supplementary sealers/topcoats should be applied based on the performance requirements of the coating class. Requirements for each class of coating are given in Table 1.

4.1 Passivation Treatment

A trivalent chromium passivation treatment will be applied to the zinc-nickel plated surface in order to enhance corrosion resistance. Hexavalent chromate conversion coatings are not permitted on zinc-nickel plated parts used on NAVISTAR products.

4.2 Appearance

The clear/blue/silvery/gray color characteristic of trivalent chromium passivation coatings will be provided for C Class codes (e.g., Class ZNi-C1). If black is desired, a B class code (e.g., Class ZNi-B1) can be specified. If other colors are required, it must be specified on the drawing or purchase order. Black parts plated to Class ZNi-B1 or ZNi-B2 should exhibit a harmonious deep black appearance when subjected to natural light, and not show lighter areas or areas of iridescence not consistent with a deep black color. When Class ZNi-B2 is used, particularly for black cosmetic applications, parts will be subjected to 48 hr salt spray testing after which no white blush will be observed.

4.3 Corrosion Resistance

Parts plated according to the requirements of this specification will be capable of withstanding neutral salt spray testing for the required minimum number of hours for the plating class designated in Table 1. The performance expectation assumes that the part will be used as plated and that there is no "handling damage" to the coating or post-plating forming of the parts. The corrosion performance of parts subjected to additional fabrication or forming, or which are part of an assembly when tested after plating shall be by agreement with supplier and appropriately documented.

After the specified minimum hours of test, there will be no zinc oxidation products or base metal corrosion (red rust) on significant surfaces. Significant surfaces for evaluation of fasteners will be defined as all exposed surfaces of fastener(s) when installed, including but not limited to fastener heads, socket recesses, SEMS washers, and external surfaces of nuts. Threads and points are excluded unless otherwise specified on drawing. On parts other than threaded fasteners, significant surfaces will include all plated surfaces; deep recesses, blind holes, edges, and tubing interiors are excluded unless otherwise specified on drawing. See Section 6.2.2 for corrosion test method.

(Note that the salt spray test is used to verify that the plating meets the requirements of the specification. The test shall not be assumed to have any correlation to actual service life or performance of the part.)

4.4 Plating Thickness

Thickness of zinc-nickel plating on parts supplied to this specification shall meet the minimum plating requirements for the applicable class as specified in Table 1. Coating thickness will be sufficient to provide corrosion performance requirements as specified for the given Class. *Use of a zinc strike layer is not permitted.* Thickness of the passivation coating and other supplementary coatings (sealers, topcoats, waxes, etc.) is not included in thickness measurements. Coated fasteners must pass all appropriate Thread Go gages for thread sizing. Threads may be produced undersized prior to plating providing that the finished

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