

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)		NUMBER: MPAPS B00-5002
		Former Designation: EMS B00-5002
TITLE: Dry Film Lubricant Coating		CURRENT REV No.: 1412
		DATE: Dec. 2014
WRITTEN/EDITED BY: Materials Engineering	APPROVED BY: Materials Engineering	SUPERSEDES: EMS B00-5002 - Sept. 2004
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: Converted to MPAPS format; misc. editorial changes.		

1.0 APPLICATION

This specification covers several types of coatings:

1.1 TYPE I

This coating is used on exhaust manifold gaskets to reduce friction between mating surfaces.

1.2 TYPE II - IV, VIII and IX

This coating is used as a release agent for paper and graphite gaskets.

1.3 TYPE VII

This coating is applied to elastomeric seals to facilitate assembly and provide identification.

CAUTION: *Certain solvents, rubbing or scraping, and stretching, can remove the coating. The size of the removed coating particles can vary (ref. the coating thickness cited in this document; and paragraph 4.5 "Coating Material" ...solids shall be less than 5 micrometers (.0002inch)) and must conform to the limits specified in MPAPS F-2 for the Cleanliness Level designated on the component and/or assembly drawing. Qualification in the actual application is required to determine if coating debris will be deleterious to the function of the components, e.g. injectors.*

1.4 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.

2.0 SCOPE

2.1 TYPE I

This specification covers an air dry, spray applied resin bonded MoS₂ dry film lubricant coating.

2.2 TYPE II

This specification covers a heat cure; roll applied resin bonded MoS₂ dry film lubricant coating.

2.3 TYPE III, V and VI

This specification covers a heat cure, roll applied, resin bonded MoS₂/TFE dry film lubricant.

2.4 TYPE IV

This specification covers a heat cure, spray applied, resin bonded MoS₂/TFE dry film lubricant.

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2.5 TYPE VII

This specification covers a resin bonded PTFE lubricant.

2.6 TYPE VIII:

This specification covers a proprietary heat cure, roll coated, inorganic coating.

2.7 TYPE IX

This specification covers a proprietary heat cure, roll coated, polymeric coating.

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/TS16949	ASTM D 2834
NAVISTAR Manufacturing Standard MS-D-13	ASTM D 3363
CFR Title 29, Part 1910	ASTM D4138
NAVISTAR MPAPS F-2	ASTM D 5620
ASTM D 2877	ASTM F 607
ASTM D56	MIL-A-8625
ASTM D70	MIL-P-16232
ASTM D 185	MIL-S-5059
MPAPS B-50	

4.0 MATERIAL REQUIREMENTS

4.1 TYPE I

4.1.1 Physical Properties and Specifications

Viscosity	15 sec. #4 Zahn Cup
Weight per gallon, ASTM D70	1473.8 (12.3) kg/m ³ (pounds)
Specific gravity, ASTM D70	1.47
Coefficient of friction range, ASTM D2877	.07-.11
Solids Content, ASTM D2834	55.5%
Particle Size:	
Percent passing 200 mesh screen, %	98
74 micrometer (74 microns)	
Percent passing 325 mesh screen, %	83
44 micrometer (44 microns)	
Flash Point, C(F)<ASTM D56 (Tag Closed Cup)	40.6 (105)
Cure (follow one of the following 3 cycles)	3-1/2 hrs. @ 190° C (375° F)
	1-1/2 hrs. @ 232° C (450° F)
	1/2 hr. @ 260° C (500° F)
Color	Grayish black
Diluent	Toluene
Resin Type	Thermosetting
Lubricating solids effective from	-53.9° C to 648.8° C
	(-65° F to 1200° F)

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4.1.2 Thermal Stability

The purpose of this requirement is to insure the quality of the bonded material and does not reflect the ability of the coating to be effective at 648.8° C (1200° F).

Requirement

3 hrs exposure at 200° C (500° F) followed by 3 hrs exposure at -53.9° C (-65° F).

The fully cured coating shall not show any loss of adhesion, flaking or softening after the above exposure.

4.1.3 Endurance Life

The bonded solid film coating, when tested on a Falex Lubricant Tester, shall have an average endurance life of at least 60 minutes @ 453 kg (1000#) gage load. The endurance life of any single run shall not be less than 50 minutes.

Test specimens: Test specimens may be purchased from the Falex Corporation, 2055 Comprehensive Drive, Aurora, IL 60505, and each set of specimens shall consist of the following:

Two V-blocks of AISI C1137 steel having a Rockwell hardness of 20-24 HRC and a surface finish of 0.304 to 0.355 micrometer (12 to 14AA). One test pin of 3135 steel having a Rockwell hardness of 80-83 HRB, and a surface finish of 0.152 to 0.203 micrometer (6 to 8 AA).

4.1.3.1 Specimen Preparation

The test specimens shall be prepared in accordance with the following procedure:

IMPORTANT: CHLORINATED OR OTHER CLASS 1 OZONE DEPLETING SUBSTANCES SHOULD NOT BE USED.

- a) Degrease all test specimens using an Ultrasonic Cleaner (Falex Corporation F100-34 Ultrasonic Cleaner), immerse test specimens in Stoddard Solvent and clean for 10 minutes.
- b) Remove test specimens and wipe dry with a lint free cloth.
- c) Place test specimens in a second bath of Analytical Grade Isopropyl Alcohol and clean for 10 minutes using the Ultrasonic Cleaner.
- d) Remove test specimens, allow to air dry, then place in a desiccator until ready to use.

All degreased test specimens in the desiccator must be used within an 8 hour time frame.

NOTE:

To facilitate cleaning small test specimens, separate containers (500 ml approx.) may be used to hold the Stoddard Solvent and Analytical Grade Isopropyl Alcohol, which can then be placed in the Ultrasonic Cleaner tank containing tap water.

Refer to ASTM D 5620, ANNEX, A1 SPECIMEN PREPARATION.

- e) Phosphate - as specified for type M, Class 3 of MIL-P-16232.
- f) Apply lubricant to pin and V-block as specified below.

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