

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)		NUMBER: MPAPS K18-5011
		<i>Former Designation: EMS D18-5011</i>
TITLE: RUBBER COATED METALS		CURRENT REV No.: 1408
		DATE: AUGUST 2014
WRITTEN/EDITED BY: Materials Engineering	APPROVED BY: Materials Engineering	SUPERSEDES: EMS D18-5011 – Rev. Aug. 2011
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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: Changed to new MPAPS format; editorial changes.		

1.0 APPLICATION

This specification covers gasket materials intended for use in environments of diesel engines like oils, fuels, coolants, and air.

2.0 SCOPE

This specification covers the material requirements consisting of a solid metal core, coated on both sides with a cured thin layer of an elastomer without an adhesive.

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 MATERIAL REQUIREMENTS

(ASTM Standards, latest issue)

3.1 Type I

3.1.1 Mechanical and Physical Properties, 9RMR6, ASTM F868

3.1.1.1 R = ASTM D2000:

M2BK707B13Z1Z2Z3Z4Z5Z6Z7Z8

Z1 = Compressibility 45 – 55%

Z2 = Recovery 80% min.

Z3 = Volume change, Fuel A, 2% max.

Z4 = Volume change, Fuel B, 15% max.

Z5 = Volume change, ASTM #1 Oil, 5% max.

Z6 = Volume change, ASTM #3 Oil, 10% max.

Z7 = NBR polymer

M = ASTM A109:

Core -SAE 1010 cold rolled steel sheet, Type 1, per MPAPS A-6 Part I

HRB 84 min.- full hard 0.015 ± 0.0015 inch thick.

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3.1.2 Nitrile Rubber Coating

Combined thickness of coating (top and bottom) - 0.005 ± 0.001 inch thick

The rubber coating minimum thickness per side - the thinner thickness of the two cannot be less than $\frac{1}{2}$ the thickness of the other.

3.1.3 Nominal Overall Thickness: 0.020 inch

Overall thickness tolerance ± 0.002 inch

3.1.4 Surface Treatment

Rubber is coated with a thin layer of graphite on exposed surfaces as an anti-friction and release agent.

3.2 Type III

3.2.1 Mechanical and Physical Properties, 9RMR6, ASTM F36

3.2.1.1 R = ASTM D2000

M2BK707B13Z1Z2Z3Z4Z5Z6

Z1 = Compressibility 45 – 55%

Z2 = Recovery 80% min.

Z3 = Volume change, Fuel B, 15% max.

Z4 = Volume change, ASTM #1 Oil, 5% max.

Z5 = Volume change, ASTM IPM 903 Oil, 10% max.

Z6 = NBR polymer

M = ASTM A240/A240M:

Core - Stainless Steel Type 301 Strip, Full Hard, per MPAPS A-37

450 ± 20 HV (Vickers)

3.2.2 Nitrile Rubber Coating

0.002 inch thick combined thickness of coating (top and bottom).

Tolerance ± 0.0004 inch

3.2.3 Nominal Overall Thickness: 0.010 inch

Overall thickness tolerance ± 0.0008 inch

3.2.4 Surface Treatment

Rubber is coated with a thin layer of graphite on exposed surfaces as an anti-friction and release agent.

3.3 Type IV

3.3.1 Mechanical and Physical Properties, 9RMR6, ASTM F36

3.3.1.1 R = ASTM D2000

M2HK707B13Z1Z2Z3Z4Z5Z6

Z1 = Compressibility 2 - 10%

Z2 = Recovery 60% min.

Z3 = Volume change, Fuel B, 15% max.

Z4 = Volume change, ASTM #1 Oil, 5% max.

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Z5 = Volume change, ASTM IPM 903 Oil, 10% max.

Z6 = FKM polymer

M = ASTM A240/A240M:

Core -Stainless Steel Type 301 Strip, Full Hard, per MPAPS A-37

Core Hardness 450 ± 20 HV (Vickers)

3.3.2 Nominal Overall Thickness: 0.010 inch

Overall thickness tolerance ± 0.0012 inch

3.3.3 FKM Rubber Coating

3.3.4 Surface Treatment

Rubber is coated with a thin layer of graphite on exposed surfaces as an anti-friction and release agent.

3.4 Mechanical and Physical Properties to Qualify the Material

<u>Mechanical and Physical Properties</u>	<u>Type I</u>	<u>Type II</u>	<u>Type III</u>	<u>Type IV</u>
Based Metal	1010 CRS		301 SS, FH	301 SS, FH
(ASTM D1056) Specific Gravity (Slab Data)	Min. 1.32 Nom. 1.33 Max. 1.34	N/A		
(ASTM D412) Tensile Strength of Rubber only, psi (Slab Data)	Min. 1100		Min 1100	Min. 1100
(ASTM D2240) Hardness Shore A (Slab Data)	Min. 70 Nom. 75 Max. 80		70 75 80	70 75 80
(ASTM F36 Procedure G) Compressibility at 1000 lbs/in ² , % (Slab Data)	Min. 45 Nom. 50 Max. 55		45 50 55	45 50 55
(ASTM F36 Procedure G) Recovery From 1000 lbs/in ² , % (Slab Data)	Min. 80		Min. 80	Min. 80
(ASTM D395, Method B) Compression Set 22 hr @ 158 ° F & 25% Deflection, %	Max. 15		Max. 15	Max. 15

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