

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)		NUMBER: MPAPS K - 6916
		Former Designation: TMS-6916
TITLE: Adhesive/Sealant, Heat Expanding		CURRENT REV No.: 1610
		DATE: October 2016
WRITTEN/EDITED BY: A. Hasan	APPROVED BY: R. Goluch	SUPERSEDES: Rev. 1606 – June 2016
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>		

1.0 APPLICATION

This specification describes the requirements for various types of heat expandable and curing adhesives and sealants suitable for use as anti-flutter adhesives in cab roofs and doors and for sealing holes and joints.

2.0 SCOPE

This specification covers the general requirements, property and performance requirements, quality, source approval and quality control requirements.

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 Specifications, Standards, and Regulations are referenced in this specification.

Quality System Standard ISO 9001 or TS-16949	NAVISTAR MPAPS P-9543	SAE J243
CFR Title 29, Part 1910	NAVISTAR MPAPS B-6815	SAE J1523
NAVISTAR Supplier Packing and Shipping Std. D-13	ASTM B117	SAE J1553
NAVISTAR Engineering Design Std A-16	ASTM D5	
NAVISTAR MPAPS B-50	ASTM D471	
NAVISTAR MPAPS G-5	ASTM D2240	

4.0 REQUIREMENTS

4.1 Description of Types

4.1.1 Type I (Replaced By Type III)

Type I was a plastisol type sealant. It is NOT RECOMMENDED FOR NEW DESIGN. Type I has been replaced by Type III.

4.1.2 Type II

An extruded elastomeric adhesive that can be used for bonding roof and other panels to reinforcements over a range of gap sizes. This product is used with oily metal and must be compatible with pretreat and E-coat operations. It expands and cures in the primer oven in a temperature range of 149-177°C (300-350°F).

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. ©2016 by Navistar, Inc.

OCTOBER 2016



Documents

Page 1 of 11

Document Sharing Hub

NUMBER: MPAPS K-6916	TITLE: <i>Adhesive/Sealant, Heat Expanding</i>	REVISION: 1610
--------------------------------	--	--------------------------

4.1.3 Type III

A pumpable elastomeric adhesive and sealant designed for bonding reinforcements to cab panels and for filling seams, gaps and holes. It shall be suitable for use in resistance-welded joints. This product is used with oily metal and must be compatible with pretreat and E-coat operations. It expands and cures in the primer oven in a temperature range of 149-177°C (300-350°F).

4.1.4 Type IV

Same as Type II except for reduced expansion properties suitable for joints with narrower gaps.

4.1.5 Type V

Similar to Type II except it is generally applied over the E-coat primer as an air/dust sealant.

4.1.6 Type VI

Similar to Type II except it is extruded or molded in a unique shape to improve fit/assembly and to further resist wash off.

4.1.7 Type VII

Similar to Type II except for its design intention as NVH (Noise and Vibration Harshness) or water/air barrier. It expands and cures in E-coat oven at a temperature range of 160-205C (320–400F).

4.1.8 Type VIIA

Same as Type VII except it has higher expansion properties and a lower viscosity.

4.1.9 Type VIII

Similar to Type II except it cures at a lower temperature.

4.1.10 Type IX

Similar to Type II except it cures at a lower temperature and is non-expanding.

4.1.11 Type X

An extruded rubber-based foam co-extruded on a pressure sensitive adhesive layer designed for sealing water and dust and also for noise reduction at high frequencies.

4.2 Uncured Properties

4.2.1 Percent Solids (except Type VIII)

4.2.1.1 Method: SAE J243 Procedure ADS-7, Method A

4.2.1.2 Required: 98% min.

4.2.2 Density

4.2.2.1 Method:

4.2.2.1.1 All types except Type VIII: water displacement or equivalent

4.2.2.1.2 Type VIII: ASTM D71

4.2.2.2 Required:

4.2.2.2.1 All types except Type VIII: 1.25-1.50 g/cc.

4.2.2.2.2 Type VIII = 0.4 – 1.0 g/cm³

4.2.3 Viscosity (except Type VIII)

4.2.3.1 Method:

4.2.3.1.1 Types II, IIA, IV, V, VI, VII, VIIA, IX, X: ASTM D5 Penetration Method, 100 g T.M.L., 5 Sec.

4.2.3.1.2 Type III: SAE J243, Procedure ADS-1, Agitated-Conditioning Method C, Pressure Flow Method 275 kPa (40 psi), 25 ± 1°C (77 ± 2°F), 20 g Load, 2.64 mm (0.104 in) Orifice

4.2.3.2 Required:

4.2.3.2.1 Type III = 30-50 Sec.

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. ©2016 by Navistar, Inc.

OCTOBER 2016



Documents

Page 2 of 11
Document Sharing Hub

NUMBER: MPAPS K-6916	TITLE: <i>Adhesive/Sealant, Heat Expanding</i>	REVISION: 1610
---------------------------------------	---	---------------------------------

4.2.3.2.2 Types II, IV, V, VI = 5.0-7.5 mm Penetration

4.2.3.2.3 Type IIA = 8.0-10.00 mm Penetration

4.2.3.2.4 Type VII = 13.0-15.0 mm Penetration

4.2.3.2.5 Type VIIA = 0.75 mm – 2.75 mm

4.2.3.2.6 Types IX, X = To Be Determined

4.2.4 Aged Viscosity (except Type VIII)

4.2.4.1 Method: Age samples at $54 \pm 1^{\circ}\text{C}$ ($130 \pm 2^{\circ}\text{F}$) for 72 hours.

4.2.4.2 Required: All Types - Shall show no visible hardening or loss of tack.

4.2.5 Hardness - Types V and VI

4.2.5.1 Method: ASTM D2240, Type A

4.2.5.2 Required:

4.2.5.2.1 Type V = 75 ± 10 points

4.2.5.2.2 Type VI = 55 ± 10 points

4.2.6 Aged Hardness Types V, VI

4.2.6.1 Method: ASTM D2240, Type A. Age samples 72 hours at 43°C (110°F)

4.2.6.2 Required: No change from initial hardness

4.2.7 Cure Temperature Cycle

4.2.7.1 Cure or polymerization shall be obtained when exposed to the following recirculating air oven temperature (Test with samples cured at each bake cycle):

Low Bake: To be determined by manufacturing facility

Over Bake: 60 minutes at $177 \pm 1^{\circ}\text{C}$ ($350 \pm 2^{\circ}\text{F}$)

4.2.8 Wash-Off Resistance - All Types (Except Type VIII)

4.2.8.1 Method: SAE J243, Procedure ADS-5

4.2.8.1 Required: No displacement of the adhesive due to lack of adhesion.

4.2.9 Odor

It shall be the supplier's responsibility to determine that the constituent materials and finished product are deemed to be non-objectionable and meet all safety standards.

4.2.10 Process Compatibility

Uncured sealer/adhesive must remain in joints without flow or washout through the spray and immersion stages of pretreat and E-coat. The supplier is responsible to work with E-coat primer and pretreatment suppliers to insure that sealer/adhesive will not contaminate these process baths.

4.3 Property And Performance Requirements

Tests performed after adhesive has been cured as specified in Table 1.

4.3.1 Bond line Thickness, minimum test thickness of cured materials shall be as follows:

4.3.1.1 Type III, VIII: - 0.030 in

4.3.1.2 Type II,V,VI: - 0.40 in

4.3.1.3 Type IV: - 0.15 in

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. ©2016 by Navistar, Inc.

OCTOBER 2016



Documents

Page 3 of 11
Document Sharing Hub

NUMBER: MPAPS K-6916	TITLE: Adhesive/Sealant, Heat Expanding	REVISION: 1610
---------------------------------------	--	---------------------------------

- 4.3.1.4 Type VII: - 0.06 in
- 4.3.1.5 Type IX: - 0.035 in
- 4.3.1.6 Type VIIA: - 0.06 in
- 4.3.1.7 Type X: - To Be Determined

4.3.2 Shear Strength (except Type VIII)

4.3.2.1 Method: SAE J1523 with shear lap of 1 inch using two steel* panels cured and pulled at a rate of 50 mm (2 in) per minute.

* Type II and Type VI require aluminum panels. Type V requires E-coated aluminum panels.

4.3.2.2 Required: All Types: 90% minimum cohesive failure, and Type VI - 80 psi minimum, breaking strength.

4.3.3 Adhesion

4.3.3.1 Method: SAE J1553

4.3.3.2 Required: All Types will exhibit a 90% minimum cohesive failure at room temperature. Minimum strength will be:

- 4.3.3.2.1 Type III: 40 lbf with steel coupons
- 4.3.3.2.2 Type II,VI,VIII,IX: 15 lbf with aluminum or steel coupons, as applicable
- 4.3.3.2.3 Type IV: 10 lbf with steel coupons
- 4.3.3.2.4 Type V: 10 lbf with E-coated aluminum coupons
- 4.3.3.2.5 Type VII,VIIA: 5 lbf with steel coupons
- 4.3.3.2.6 Type X: To Be Determined

4.3.4 Sheet Metal Lubricant Compatibility

4.3.4.1 Method: Prepare panels for shear strength and adhesion testing except metal to be coated with MPAPS B-6815 processing compound (not required for materials applied over E-coat, Type V; not required for Type VIII).

4.3.4.2 Required: Same as Shear Strength and Adhesion

4.3.5 Corrosion (except Type VIII)

4.3.5.1 Method: ASTM B117 salt spray test for 96 hours on coupons prepared the same way as the coupons for shear strength test. Perform shear strength test after corrosion exposure.

4.3.5.2 Required: All Types - No visible loss of adhesion. Type VI - 55 psi min breaking strength.

4.3.6 Low Temperature Impact

4.3.6.1 Method: SAE J243 Procedure ADS-2, Method A at -29°C (-20°F).

4.3.6.2 Required: All Types - No visible cracking or loss of adhesion to the base panels.

4.3.7 Expansion

4.3.7.1 Method: Cure product in accordance with schedules in Table 1 and determine volume change per ASTM D471 (Type VIII expansion is measured as described in the appendix)

4.3.7.2 Required:

- 4.3.7.2.1 Type IV = 150% minimum
- 4.3.7.2.2 Type II,V,VI = 200% minimum
- 4.3.7.2.3 Type III = 50% minimum

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. ©2016 by Navistar, Inc.

OCTOBER 2016



Documents

Page 4 of 11
Document Sharing Hub