

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)		NUMBER: MPAPS- L-6512
		Former Designation: TMS-6512
TITLE: Foam and Sponge, Static Sealing		CURRENT REV No.: 1710
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1.0 APPLICATION

This specification covers two general types of die cut foam or sponge for static sealing applications which can be further specified by material. The first are flexible semi-closed cell foams suitable for sealing systems where restricted air flow is desired. The second is expanded rubber or sponge where the material must be closed cell or exhibit properties associated with closed cell rubber materials. This specification also covers three grades of non-connected cellular polyvinyl chloride product.

2.0 SCOPE

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

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	MPAPS L-6510	PSTC-31
CFR Title 29, Part 1910	ASTM C972	PSTC-2
NAVISTAR Supplier Packing and Shipping Std. D-13	ASTM D1056	FMVSS 302
NAVISTAR Engineering Design Std A-16	ASTM D1564	
NAVISTAR MPAPS B-50	ASTM D1667	
MPAPS P-9543	ASTM D3574	
MPAPS K-6929	MPAPS G-5	
MPAPS P-9544	MPAPS GT-31	

4.0 REQUIREMENTS

4.1 Classification and Construction

Type designations are used to specify the application in the system and the allowed materials that can be used to meet those requirements. Suffix designations are used to specify the specific materials and hardness required for the application. Pressure sensitive adhesives may be specified on the engineering drawing and meet the requirements herein.

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4.1.1 Types

4.1.1.1 Type 1 – Semi-permeable foam or sponge. This is typically used where low flange sealing pressures are present and a small amount of moisture absorption is not an issue. Typical applications include HVAC components, transmission covers, and electrical covers. Typical materials include vinyl, low permeability urethane, micro cellular urethane and silicone.

4.1.1.2 Type 2 – Closed cell expanded rubber. This is typically used for exterior sealing applications with higher flange pressures though some softer materials are available. Typical materials include EPDM, blends of SBR and CR and silicone.

4.1.1.3 Type 3 – Non-connected cellular polyvinyl chloride product with a pressure-sensitive adhesive on one side, protected with a release paper. This is intended for use as a compression seal that inhibits the passage of air, water, and dust in assembled joints or components. This type is divided into three classes.

4.1.2 Materials

Grades A through C and Grade H are usually associated with Type 1 applications; Grades D through F are usually Type 2; and Grades G and Z with either – please contact Materials Engineering and supplier if other combinations are desired. If only a type is specified, then any appropriate material is acceptable that will work in the application. Selection of material and determination of its suitability should be done in consultation with Materials Engineering.

4.1.2.1 Grade A – Vinyl

4.1.2.2 Grade B – Low permeable urethane foam

4.1.2.3 Grade C – Micro cellular urethane foam

4.1.2.4 Grade D – EPDM elastomer

4.1.2.5 Grade E – SBR blends

4.1.2.6 Grade F – CR blends

4.1.2.7 Grade G – Silicone elastomers

4.1.2.8 Grade H – Polyethylene closed cell foam

4.1.2.9 Grade Z – Materials not currently listed above, so designate polymer type in engineering note.

4.1.3 Classes (Type 3 only)

4.1.3.1 Class I (Firm) – this material is formulated to seal under high compressive forces experienced in mechanically fastened assemblies, such as riveted joints in cab construction.

4.1.3.2 Class II (Medium) – this material is formulated to seal where medium compressive forces are experienced and where irregularities on mating surfaces are encountered. This product is recommended for application where dimensional stability is necessary on thin wall die-cut parts.

4.1.3.3 Class III (Soft) – this material is formulated to seal where light compressive forces are experienced and greater irregularities and tolerances are encountered.

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4.1.4 Hardness Grades

Various hardness grades are available in many of these materials. In general, hardness shall follow ASTM D 1056 conventions for compression force deflection ranges. When specified, the hardness grade shall be noted parenthetically at the end of the note.

Grade	Compression Deflection at 25% Deflection	
	kPa	psi
0	Less than 15	Less than 2
1	15 – 35	2 – 5
2	35 – 65	5 – 9
3	65 – 90	9 – 13
4	90 – 120	13 – 17
5	120 – 170	17 - 25

4.2 Material Requirements

The following material properties shall be determined by the methods indicated in ASTM D 1056, with the exception of Type 3 materials.

4.2.1 Grade A – Vinyl

4.2.2 Grade B – Low permeable urethane foam – no grade designations; shall meet MPAPS L-6510.

4.2.3 Grade C – Micro cellular urethane foam

4.2.4 Grade D – EPDM elastomers

4.2.5 Grade E – SBR blends

4.2.6 Grade F – CR blends

4.2.7 Grade G – Silicone elastomers

4.2.8 Grade H – Polyethylene closed cell foam

4.2.9 Type 3 shall consist of non-connected cellular polyvinyl chloride resin base foam, with a suitable pressure-sensitive adhesive on one surface, protected with an easy release liner paper. When compressed a min of 30%, this material is designed to produce a satisfactory seal.

4.2.10 Pressure Sensitive Adhesives – Generally, adhesives supplied to this specification only need to adhere until assembly is complete (as a seal in compression does not usually need an adhesive). In those cases where better, more durable performance is required, the adhesive shall meet MPAPS K-6929. In both cases the adhesive needs to survive the environment the seal is intended for without causing any detrimental effects to the performance of the seal. Please contact Materials Engineering if further guidance is required.

4.2.10.1 For Type 3, the adhesive shall be of a long-aging high tack contact adhesive formulation.

4.2.11 Release Paper (Type 3 only) – this product is manufactured so that as the foam material is unrolled, the adhesive surface is expose and the release paper remains on the adhesive free surface. Release paper shall remain with the tape and be removed after application. This paper shall release easily and cleanly from the foam.