

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)		NUMBER: MPAPS D-7133
		Former Designation: TMS-7133
TITLE: Material, Process and Quality Control Requirements for Liquid Composite Molded Parts		CURRENT REV No.: 1412
		DATE: Dec. 2014
WRITTEN/EDITED BY: Materials Engineering	APPROVED BY: Materials Engineering	SUPERSEDES: TMS-7133 – Aug. 2006
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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 describes engineering property and quality requirements for the selection of those materials to be utilized in the Liquid Composite Molding process (LCM). This includes such materials as dicyclopentadiene (DCPD) and urethane.

2.0 SCOPE

This specification covers general, material property requirements, tooling requirements, surface appearance, pre-paint requirements, PPAP, quality and quality control, source approval, shipping and identification requirements and designation on drawings for parts produced using the LCM process.

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	ASTM D790
CFR Title 29, Part 1910	ASTM D638
NAVISTAR Manufacturing Standard MS-D-13	ASTM D570
NAVISTAR MPAPS B-50	ASTM D792
NAVISTAR CEMS Test Method DT-4	SAE J1344
NAVISTAR CEMS Test Method GT-5A	Metton® Post Molding Guide *
NAVISTAR MPAPS G-9005	

* The Metton® Molding Guide is available from: Metton of America Inc.
3800 Camp Creek Pky.
Building 1800 Suite 126
Atlanta GA 30331

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4.0 GENERAL QUALIFICATION

Individual parts of the composite/assembly must meet all of the requirements of the material specification(s) shown on the engineering drawing for the part and/or subassembly in addition to meeting all requirements of this specification.

4.1 Tooling requirements

Selection of tooling materials, construction methods and maintenance procedures shall be such that a minimum of 30,000 parts can be produced without deterioration of the surface finish. After the initial production (30,000 pieces), repair of the molds is restricted to a maximum of 25% of the mold surface and such repair shall not result in degradation of the surface quality of the part.

4.2 Material Properties

<u>Property</u>	<u>ASTM Method</u> <u>Unless otherwise specified</u>	<u>DCPD</u> <u>Requirement</u>
Density, max, kg/m ³	D 792	1.05
Water absorption (24 hrs), max.	D 570	0.5%
Tensile Strength, min	D 638	6.5 ksi
Tensile Modulus, min	D 638	250 ksi
Flexural Strength, min	D 790	10 ksi
Flexural Modulus, Tangent, min	D 790	250 ksi
Gardner Impact, -20C, min	CEMS DT-4	8.0 ft-lbs

4.3 Part Marking

As an aid to recovery and recycling of plastic parts, each part shall be marked to identify the type of polymeric material the part is comprised of. Part marking shall be in accordance with SAE J1344. Each part shall be identified so as to provide traceability to resin lot, molding date, and operator.

4.4 Surface Appearance

This requirement applies to parts identified on the drawing by a zone designation as per MPAPS G-9005. Parts such as hoods, fenders, or other highly visible parts are considered to be Zone I as per MPAPS G-9005. The surface is to be uniform, i.e. no areas of discontinuity, blisters, cracks, chips etc., are allowed. Small defects, such as pinholes, pits and small dirt particles, are to be minimized. No more than 12 of these small defects per part, or 6 within a 3-square inch (1935 mm²) area, is permitted.

4.5 Pre-paint Finish

For parts requiring a pre-paint finish, the pre-paint treatment will conform to the requirements of MPAPS G-9005. Parts requiring a pre-paint finish should be prepared in accordance with the resin/material supplier's recommended practice, e.g., per the Post Molding Guide for Metton®. Surface appearance requirements will be in accordance with the zone descriptions in MPAPS G-9005 for the primed surfaces. The pre-paint finish shall be adherent to the surface such that it will pass the Adhesion of Paint Test as per CEMS Test Method GT-5A.

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