

NAVISTAR, INC.		
TMS (TRUCK MATERIAL SPECIFICATION)		NUMBER: TMS-7100
TITLE: PVC Injection Molding Compounds		CURRENT REV. No. : 0904
		DATE: April 2009
WRITTEN/EDITED BY: Materials Engineering	APPROVED BY: Materials Engineering	SUPERSEDES: Rev E - August 2002
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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: Replaced "International Truck and Engine Corporation" with "Navistar, Inc." per corporate directive; added CEMS B-50 requirement; added section 4.1 Accelerated Weathering; revised Section 5.0; editorial changes.		
Reference: File 30-14D	Keywords: Molded PVC; Electrical Connectors	

1.0 APPLICATION

This specification covers non-rigid, lead-free, thermoplastic (PVC) compounds suitable for molding electrical connector bodies.

2.0 SCOPE

This specification covers the property and performance requirements for four grades of molding compounds, method of qualification, source approval and quality control, and approved sources.

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 CEMS 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	CEMS B-50	ASTM D 746	ASTM D 1203
CFR 29, Part 1910	ASTM D 638	ASTM D 792	ASTM D 2240
NAVISTAR Mfg Std. MS- D-13	ASTM D 635	ASTM D 1004	UL-1581-492
		TMS-9543	CEMS GT-31

4.0 PROPERTY AND PERFORMANCE REQUIREMENTS

Property	ASTM Test Method	REQUIRED*	
		Grade A	Grade B
Durometer Hardness $\pm$ 3 (Shore A, 15 sec)	D 2240	80	60 (65 Optional)
Specific Gravity (Method A)	D 792	1.36/1.43	1.16/1.21
Tensile Strength (Die C), MPa min	D 638	10.3	9.3
(Die C), (psi) min		(1500)	(1350)
Elongation, % min	D 638	275	350
Modulus @ 100% Elongation, MPa	D 638	6.2	3.1
(psi)		(900)	(450)
Tear Resistance, kN/m	D 1004	35	21.8
(lbf/in)		(200)	(125)
Brittleness Temperature, C (Method A)	D 746	-24	-41

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Flame Resistance	D 635	S.E.	S.E.
Volatile Loss (@ 105° C), max %	D 1203	3	5
Color	Visual	Black	Clear
Composition	UL-1581-492	Material supplied must be free of lead**.	
* Grades C and D are no longer used - see Materials Engineering for more information.			
** Max lead content is 0.01%. No intentional addition of lead, during manufacture or processing, is permitted.			

4.1 Accelerated Weathering

4.1.1 Under hood or Interior parts which are exposed to sunlight under glass parts shall be tested per CEMS GT-31 Method A for a minimum of 1200 kj.

4.1.2 Exterior parts shall be tested per CEMS GT-31 Method B for a minimum of 3600 kj.

4.1.3 Required – shall have no visible color change greater than ΔE of 3.

5.0 QUALITY

All material produced to this specification shall be clean and free of dirt, grease, and contamination. All debris from cutting and processing shall be removed. Parts shall be free of voids.

5.1 Qualification

Materials submitted for approval to this specification shall include the following:

5.1.1 A detailed, signed test report documenting testing to this specification per TMS-9543.

5.1.2 The complete procedure used for preparing and curing materials for test, especially surface preparation (when appropriate) and condition of the test materials.

5.1.3 A complete description, including engineering prints and pictures of any non-standard test fixtures used.

5.1.4 Adhesive, substrate and any chemicals used for bonding where appropriate.

5.2 Submission The material test report shall be submitted to:

Manager of Materials Engineering
NAVISTAR, Inc.
PO Box 1109
Fort Wayne, IN 46801

5.3 Approval A report from NAVISTAR will be issued approving new materials to this specification. Formal approval is not granted until this report has been published and the new material is listed in this specification. However, the approval report may be used as authorization for usage of that approved material/process prior to a change to this specification.

6.0 SOURCE APPROVAL AND QUALITY CONTROL

6.1 Supplier Requirements

All suppliers to NAVISTAR are required to be registered to ISO 9001 Quality System Requirements. NAVISTAR will also accept TS-16949 registration as long as the supplier can also fulfill all AIAG PPAP (Production Part Approval Process) documentation and approval requirements. Suppliers must maintain their certification with an accredited registrar and must furnish copies of registration certificates to their Corporate Buyer upon request.

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