

NAVISTAR, INC.		
TMS (TRUCK MATERIAL SPECIFICATION)		NUMBER: TMS-6003
TITLE: Wire Reinforced Air Duct	CURRENT REV. No. : 0904	DATE: April 2009
WRITTEN/EDITED BY: Materials Engineering	APPROVED BY: Materials Engineering	SUPERSEDES: September 2000
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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 Sec. 4.4.4, 4.4.5 and 5.1; editorial changes.		
Reference: File 20-3	Keywords: Air Ducts; Wire Reinforced Duct	

1.0 APPLICATION

This specification covers air ducts consisting of continuous elastomeric tape helically wound to overlap and underlay a hard drawn wire. These air duct products are used in heater, defroster and similar applications.

2.0 SCOPE

This specification covers general requirements, property and performance requirements, quality, identification, 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 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 <i>ISO 9001 or TS-16949</i>	ASTM D 622	CEMS B-50
NAVISTAR Mfg. Standard MS-D-13	ASTM D 751	TMS-9543
NAVISTAR CEMS A-9	ASTM D 2000	TMS-9544
CFR Title 29, Part 1910	FMVSS 302	

4.0 GENERAL REQUIREMENTS

4.1 Style I - Obsolete, use Style II

4.2 Style II (Rubber Cover)

4.2.1 Steel Wire

Spacing: Shall be shown on engineering drawing. Diameter: 0.94-0.99 mm (0.037-0.039 in)
 Ultimate Tensile Strength: 1.38 GPa (200 000 psi) minimum, Type 2, Type 3, or Type 6 wire per CEMS A-9 may be used at the option of the supplier. Wire should be protected from corrosion in transit and storage prior to fabrication.

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APRIL 2009

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4.2.2 Elastomeric Tape

4.2.2.1 Thickness

0.38 mm (.015 in) minimum thickness with overlap on wire of 0.8 mm (1/32 in) minimum each side of wire.

4.2.2.2 Material

Rubber per ASTM D 2000, M2BA 807 C12 F17 Z1 Z2 Z3

Z1 = EPDM Elastomer

Z2 = Shore A Durometer 75 ± 5 Points

Z3 = Heat Aging At 125°C (257°F) For 70 Hours

Durometer: Shall not exceed 95.

Tensile Change: 25% maximum

Elongation Change: 75% maximum

Note: Alternate materials, such as PVC or other thermoplastic elastomers, may be used with the approval of TDTC Materials Engineering.

4.3 Style III

[Same As Style II except Tape Thickness shall be 0.25-0.33 mm (0.010-0.013 in)]

4.4 Property And Performance Requirements

[Tests performed on 50 mm (2.0 in) duct]

4.4.1 Burst Strength: ASTM D 751

Required: 138 kPa (20 psi) minimum

4.4.2 Vacuum Collapse: ASTM D 622

Required: Shall withstand 0.89 m (35 in) water vacuum with 2.5 mm (0.010 in) maximum collapse.

4.4.3 Crush Resistance

Required: Shall withstand 1.46 kN/lineal meter (100 lbf/lineal foot) minimum.

4.4.4 Odor:

There shall be no objectionable odor as judged by an appropriate jury after aging a 300mm section for 4 hours at 70°C. To be evaluated hot.

4.4.5 Plasticizer Volatility

4.4.5.1 **Method:** Heat elastomer (no wire) for 5 hours at 104° C (220° F) in a forced convection oven. Cool in desiccator.

4.4.5.2 **Required:** No appreciable change in material pliability, and weight loss shall not exceed 2%.

4.5 Flammability Resistance

Material and parts supplied to this specification shall conform to and be certified by the supplier to meet the requirements of the latest issue of the Federal Motor Vehicle Safety Standard 302.

5.0 QUALITY

All product supplied shall be clean and free from dirt, oils, sharp edges, or defects harmful to product performance. Finished duct shall be free from objectionable odor and be flexible and suitable for bending and forming. It shall be concentric, and wire coils shall be evenly spaced and bonded to the coated fabric cover. Coated cover shall be uniform in texture and color and free from pinholes, cuts, folds, and tears.

5.1 Qualification

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

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APRIL 2009