

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)		NUMBER: MPAPS F-7029
		Former Designation: TMS-7029
TITLE: Coiled Nylon Air Brake Tubing		CURRENT REV No.: 1609
		DATE: Sept. 2016
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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>		

1.0 APPLICATION

This specification outlines the minimum requirements for a coiled nylon tubing assembly that may be used in the air brake system. The use of this product is restricted by SAE J844 and must have approval of Navistar Integrated Product Development Brake Group.

2.0 SCOPE

This specification covers the general requirements, property and performance requirements, and the quality control requirements. An approved source list is included.

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 and standards are referenced in this specification.

Quality System Standard <i>ISO 9001 or TS-16949</i>	NAVISTAR MPAPS P-9543
CFR Title 29, Part 1910	NAVISTAR MPAPS B-50
NAVISTAR Eng. Design Std. A-16	ASTM B-117
NAVISTAR Supplier Packing and Shipping Std. D-13	SAE J844
NAVISTAR MPAPS G-20	ASTM D 2122
NAVISTAR MPAPS F-7006	ASTM D 622
NAVISTAR MPAPS G-9009	ASTM A 318
NAVISTAR MPAPS F-2	

4.0 GENERAL REQUIREMENTS

The tubing and completed assembly shall meet the provisions outlined in the various requirements of this specification and the requirements of the latest issue of MPAPS F-7006.

4.1 Material

The assemblies shall be constructed of reinforced tubing meeting the requirements of MPAPS F-7006.

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4.2 Appearance

The tubing assembly shall conform to and be equivalent in surface finish and color to that of the pre-production samples approved by Navistar Industrial Design. Assemblies supplied to this specification shall be smooth and uniform, free from any visible defects, foreign matter, kinks, seams or any other conditions that would impair the performance.

4.3 Color

The tubing formulation shall be consistent in hue and of uniform saturation so that it matches the appearance of pre-production approved samples and meets the applicable color requirements of the aforementioned standards. Approved color shall be designated on the assembly drawing.

4.4 Fittings

Fittings shall be made from brass and spring guards of steel, meeting the dimensional requirements shown on the engineering drawing. Steel shall be plated with zinc plating or painted. Zinc plated spring guards shall be per, Class 8A MPAPS G-20 except that corrosion requirement on parts is waved. None-the-less, the plating process must be verified as capable of meeting the 8A requirement using concurrently plated, test panels of cold rolled steel, tested per ASTM B-117. Non-edge surfaces must exhibit no zinc or substrate corrosion product after 72 hours. Painted spring guards will be per MPAPS G-9009, Class IIA. Paint/process performance shall be verified with panels. Spring guard free end shall be rounded and relieved to prevent abrasion of nylon tubing.

4.5 Property and Performance Requirements

All assemblies furnished to this specification shall meet the provisions and requirements of MPAPS F-7006, and, in addition, the following requirements:

4.5.1 Sag Resistance

4.5.1.1 Method

Extend coiled assembly to the maximum recommended working length (as specified on the part drawing) in a horizontal position by clamping at ends and hold for 16 hours at $24 \pm 3^{\circ}\text{C}$ ($75 \pm 5^{\circ}\text{F}$). While in the extended position, measure the deflection from a horizontal line at top of the coil at the assembly mid-point. Reduce the extension of the assembly to 50% of the recommended working length and hold. After 30 minutes, repeat the sag measurement.

4.5.1.2 Required

Sag from the horizontal shall not exceed 4% of the maximum working length for full extension nor more than 8% of maximum working length for 50% extension.

4.5.2 Force of Extension

4.5.2.1 Method

Extend coiled assembly to the maximum recommended working length at $24 \pm 3^{\circ}\text{C}$ ($75 \pm 5^{\circ}\text{F}$). Using a spring scale or other suitable measurement device, determine total force of extension.

4.5.2.2 Required

Force to extend to maximum working length shall not exceed 66.7 N (15 lbf).

4.5.3 Ovality - Nylon Tubing

4.5.3.1 Method: ASTM D 2122, Section #7, Calculations $\frac{\text{Minimum O.D.}}{\text{Maximum O.D.}} \times 100$

4.5.3.2 Required: Shall be a minimum of 75% ovality.

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