

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)		NUMBER: MPAPS- A-45, PART III
		Former Designation CEMS A-45, PART III
TITLE:	Diesel Injection Tubing	CURRENT REV No.: 1506
		DATE: June 2015
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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: MPAPS Format; Editorial Changes		

1.0 APPLICATION

High pressure diesel fuel injection lines.

2.0 SCOPE

Part III of CEMS A-45 covers the requirements for single-wall steel tubing used in the Company's products for high pressure diesel fuel injection lines.

Engineering Material Specifications covering other tubular steel products used by the Company are as follows:

Mechanical Steel Tubing	MPAPS A-10
Welded and Seamless Steel Pipe	MPAPS A-18
Structural Steel Tubing	MPAPS A-38

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 standards, specifications and regulations are referenced in this specification.

Quality System Standard ISO 9001 or TS-16949	NAVISTAR MPAPS B-50
CFR Title 29, Part 1910	ASTM A 370
NAVISTAR Manufacturing Std. MS-D-13	SAE J1958
NAVISTAR Engineering Design Std A-16	

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4.0 REQUIREMENTS

4.1 Grade Classification

Diesel injection tubing is produced in two grades which are classified as shown in Table 1.

TABLE I
GRADE CLASSIFICATION

Navistar Grade	Approx SAE Equivalent	Obsolete IH Specifications	Description
DA	J1958 Grade One	All drawings specifying MPAPS A-45, Part III, with no other added requirements.	Fully annealed, dead soft seamless tubing
DH	J1958 Grade Three	All drawings specifying MPAPS A-45, Part III, with increased properties equivalent to this grade.	Cold drawn seamless tubing annealed to approx half hard temper

4.2 Chemical Composition

Tubing purchased to this specification will be made from non-aging steel conforming to the chemical composition shown in Table II.

TABLE II
CHEMICAL COMPOSITION

Element	Ladle (Heat) Analysis, %	Check (Product) Analysis, %
Carbon	0.08-0.13	0.06-0.15
Manganese	0.30-0.60	0.27-0.63
Phosphorus	0.04 max	0.05 max
Sulfur	0.05 max	0.06 max
Silicon	0.10 max	0.12 max

4.3 Mechanical Properties

Tubing furnished to this specification will conform to the following mechanical property requirements shown in Table III, unless otherwise specified. See "Methods of Test," Section 5.3.

TABLE III
MECHANICAL PROPERTIES

Navistar Grade	Yield Strength 0.2% Offset, min		Tensile Strength, min		Elongation in 2 Inches (50mm), %, min	Hardness, Rockwell B
	ksi	MPa	ksi	MPa		
DA	29	205	44	310	30	65 max
DH	51	355	71	490	22	87 max

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