

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)		NUMBER: MPAPS A-8
		<i>Former Designation: CEMS A-8</i>
Steel Wire		CURRENT REV No.: 1610
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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

Wire Rods, Coarse Round Wire, and Finished Wire and Rope Wire made of carbon, alloy and stainless Steel. Requirements for steel wire not included in this specification are in the following Engineering Material Specifications:

Steel Wire Springs

MPAPS A-9

2.0 SCOPE

This specification covers requirements for general purpose and miscellaneous grades of steel wire and wire rods and ropes used in the Company's products. Unless otherwise specified, the appropriate ASTM Standards will apply to this 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	ASTM A1007
CFR Title 29, Part 1910	ASTM A853
NAVISTAR Supplier Packing and Shipping Std. D-13	ASTM A368
NAVISTAR Engineering Design Std A-16	ASTM A555
NAVISTAR MPAPS B-50	ASTM A510/510M
Mil Spec W6940	ASTM A752/752M
ASTM A641/641M	

4.0 REQUIREMENTS

Steel wire is classified by its usage and chemical composition.

4.1 Wire Classification and Chemical Composition

Steel wire and wire rods and ropes purchased to this specification will conform to the required analysis for the steel shown in Table I.

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TABLE I
CLASSIFICATION, CHEMICAL COMPOSITION AND DESCRIPTION OF WIRE TYPES

Type of Wire	SAE Steel Designation; ASTM Std	Description
Bright basic	1006, 1008,1010,1015, 1018,1020 A510 A853	Low carbon steel wire, hard drawn dry without any treatment or processing to change normal properties obtained by cold drawing.
Alloy Steel	A752	Alloy steel rod and wire, for applications requiring improved properties
Zinc Coated Steel	A641	Low carbon steel wire, galvanized.
Rope wire: Uncoated Steel	Standard carbon Steel* except: $P \leq 0.035\%$ $S \geq 0.045\%$ A510 A1007	Wire intended for rope fabrication. Steel is selected and carefully prepared to produce a high tensile strength wire with superior toughness. Refined drawing techniques are used to produce rope wire from thermally treated rods or wire.
Rope wire: Zinc-coated steel	A510 A1007	Wire for rope fabrication is zinc-coated to finished size or coated and drawing to finished size. The zinc coating can be applied by a hot dip or electrolytic process.
Rope wire: stainless steel	Types: 302, 304 or 316 A555 A368	Corrosion and/or heat resistant wire used for rope fabrication. Special drawing may be required to satisfy special fatigue strength requirements.

* Specific steel grade dependent upon flexibility and strength requirements of finished products.

4.2 Material Requirements

Unless otherwise specified, materials supplied shall conform to the general requirements of ASTM A510, ASTM A752 ASTM A641 or ASTM A555 as applicable.

4.3 Surface And Mechanical Requirements

4.3.1 Steel wire and rope wire purchased to this specification will conform to the surface properties shown in Table II and the mechanical requirements of ASTM A853 and A1007 respectively or A368 (Stainless Steel). See Appendix for typical mechanical properties.

4.3.2 Zinc Coated steel wire will have the surface properties and mechanical requirements of ASTM A641.

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TABLE II
SURFACE AND MECHANICAL REQUIREMENTS

Type of Wire	Surface and Mechanical Requirements
bright basic	Surface shall be bright and free from seams or scratches which would make wire unsuitable for general use. Wire shall have no appreciable cracks after being cold bent flat on itself and hammering down to a thickness of one diameter.
Alloy Steel	Per ASTM A752
Zinc Coated Steel	Temper (soft, medium or hard) and Coating Class may be specified, as per ASTM A641, in the call out. If no Coating Class is specified, minimum coating weight shall be 55g/m ² and the full surface shall be covered in zinc.
rope wire	The surface shall not contain imperfections inconsistent with good commercial practice. No cracks shall be induced by wrapping the wire twice in a close helix about a mandrel three times the nominal diameter of the wire. If the wire is zinc coated, no zinc shall be removed by rubbing with bare fingers after the coated wire is wrapped twice in a close helix about a mandrel five times the nominal wire diameter. Tensile strength is dependent on grade, thus, specific properties should comply with requirements on drawings.

4.4 Dimensional Tolerances

4.4.1 Wire purchased to this specification will meet the appropriate dimensional tolerances shown in Tables III and IV.

TABLE III
DIAMETER AND OUT-OF-ROUND* TOLERANCES, UNCOATED WIRE

Wire Diameter, mm, incl	Tolerance, plus or minus, mm		Wire Diameter, inch, incl	Tolerance, plus or minus, inch	
	Round wire in coils	Straightened and cut wire			
0.89 to under 1.93	0.02	0.02	0.035 to under 0.076	0.001	0.001
over 1.93 to 3.77	0.05	0.05	over 0.076 to 0.148	0.002	0.002
over 3.77 to 12.69	0.05	0.08	over 0.148 to 0.499	0.002	0.003
12.70 and over	0.08	0.10	0.500 and over	0.003	0.004

* Permissible out-of-round: 50% of the total gage tolerance.

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