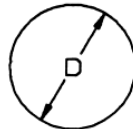


NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)		NUMBER: MPAPS S-N-21.101-GS/PL
		Former Designation: ESP-N-21.101-GS
TITLE:	Metal Balls (Noun Code – 0460) English Series	CURRENT REV No.: 1610
		DATE: Oct. 2016
WRITTEN/EDITED BY: W. Cook	APPROVED BY: R. Goluch	SUPERSEDES: 1506 - June 2015
PRINTED COPIES OF THIS DOCUMENT MUST BE VERIFIED FOR CURRENT REVISION		
<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 GENERAL:** This standard establishes the requirements for finished metal balls for rolling contact (ball) bearings and other uses as described in ANSI/AFBMA 10.
- 2.0 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 DIMENSIONS:** All dimensions in this standard are in inches. Metric dimensioned metal balls may be found on MPAPS S-NM-21.101-GS/PL.
- 4.0 NOMINAL DIAMETER:** The diameter value that is used for the purpose of general identification of a ball, e.g. 1/4" (D).
- 5.0 BALL GRADES AND TOLERANCES:**



MASTER TABLE OF BALL GRADES AND TOLERANCES (IN INCH)

Navistar® Grade	Diameter Tolerance Per Ball	"V" Block Out-of-Round in 120° Angle	Diameter Tolerance Per Unit Container	Basic Diameter Tolerance Plus or Minus	Marking Increments	Maximum Surface Roughness Microinch AA
* 24	.000024	.000024	.000048	.0001	.00001	2
100	.0001	.0001	.0002	.0005	.0001	5.0
200	.0002	.0002	.0004	.0010	.0002	8.0
1000	.001	.001	.002	.005	---	Not Applicable

* Formerly Grade 25

- 6.0 MATERIALS:** When the numeric grade designation is specified without a prefix, the balls will be manufactured from high- carbon bearing quality steel (e.g. E52100) per MPAPS A-0 Part I. SST or

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OCTOBER 2016

NUMBER: MPAPS S-N-21.101-GS/PL	TITLE: <i>Metal Balls</i>	REVISION: 1610
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BRS prefix designations are used with the numeric code when stainless steel or brass, respectively, is required.

- 7.0 POLICY FOR SELECTING PARTS FOR NEW DESIGN:** Approved parts are so designated to reduce variety of parts and assure maximum availability, interchangeability and cost savings in volume buying.

For new design, parts shall be selected from "Approved" part list only.

NAVISTAR GRADE 24

- 8.0 SURFACE ROUGHNESS:** Relatively fine-spaced surface irregularities, where height, width and direction establish the predominant surface pattern.

9.0 PART LIST:

9.1 Approved:

Nominal Diameter	Grade	Part Number
1/4	200	7911T
1/4	SST100	28546R1
11/32	100	3072917R1
3/8	24	17012R1
1/2	200	D 2616
1/2	1000	13722D
5/8	24	17020R1

10.0 TECHNICAL INFORMATION:

For further information related to the technical content of this specification, contact:	Suppliers may purchase controlled copies of this specification by contacting:
Materials Engineering and Technology Dept. 10400 W. North Avenue Melrose Park, IL 60160 E-mail: MaterialsEngineering@Navistar.com	IHS Markit Inc. 15 Inverness Way East Englewood CO 80112-5776 Phone: 1-800-854-7179 E-mail: Automotive@IHS.com Website: http://global.ihs.com

REVISION HISTORY

Revision Level	Change	Approved by	Date Approved
1610	Reinstated PN 17012R1; Editorial Changes	R. Goluch	10/21/2016

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