

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)		NUMBER: MPAPS S-FM-16.101-GS/PL
		Former Designation: ESP-FM-16.101-GS
TITLE: Washers - Metric Series	CURRENT REV No.: 1506	DATE: June 2015
WRITTEN/EDITED BY: Materials Engineering	APPROVED BY: Materials Engineering	SUPERSEDES: ESP-FM-16.101-GS - August 2006
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>		
Change Notice: Changed to New MPAPS format; Combined GS, GI, PP, NPP.		

1.0 GENERAL: Implementation of this standard must be in accordance with the policies and procedures outlined in MPAPS S-A-0.101. There may also be divisional supplemental instructions in regard to use of metric standards that should be taken into account.

Some segments of the ISO and national standards encompassed by this general specification differ. In recognition of these differences, the sizes and tolerance ranges used were established in an effort to enable the use of commercially available items, dimensionally interchangeable worldwide.

This specification contains the essentials of the following standards:

International Organization for Standardization: ISO R887
 Association of French Standards: NF E27-611
 British Standards Institute: BS 4320
 German Institute of Standardization: DIN 125
 Standards Association of Australia: AS 1237

The inclusion of dimensional data is not intended to imply that all the washers described are stock production sizes.

Inch dimensioned standard carbon steel washers may be found in MPAPS S-F-15.101-GS/PL and hardened washers in MPAPS S-F-16.101-GS/PL.

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3.0 DESIGN CONSIDERATION: Carbon steel washers are intended for general purpose applications to spread bearing load and to provide a uniform bearing surface.

Hardened washers are intended for use in high strength joints to minimize embedding, to aid torquing, and to bridge large clearance holes and slots.

4.0 METRIC-INCH RELATED SIZES: During the inch to metric design transition period, the following chart of related sizes can be used for reference. This information is not to be considered as a recommendation for substitutions but only as a means of determining approximate equivalents.

Washers	
Nominal Bolt or Screw Size	
Metric Series (mm)	Inch Series
2	5/64
3	1/8
4	5/32
5	13/64
6	3/16
8	5/16
10	3/8
12	1/2
16	5/8
20	3/4
24	15/16
30	1- 3/16
36	1- 13/32
42	1- 21/32
45	1- 3/4
48	1- 27/32
52	2- 1/16

5.0 METHOD OF DESIGNATION: Washers will be designated on purchase orders by inside diameter, outside diameter, thickness, word description, material, finish and part number.

5.5 x 10 x 1 mm, Washer, Type A, CST, ZN6A, Part Number
10.8 x 21 x 2 mm, Washer, Type B, HTS, PHC, Part Number

6.0 POLICY FOR SELECTING PARTS FOR NEW DESIGN: Approved parts are so designated to reduce the variety of parts and assure maximum availability, interchangeability, and cost savings.

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