



AEROSPACE RECOMMENDED PRACTICE	ARP5448™/6	REV. A
	Issued 2002-05 Revised 2017-02 Reaffirmed 2024-04 Superseding ARP5448/6	
(R) Plain Spherical Bearing Conformity Examination		

RATIONALE

Changes to this document are the result of a Five-Year Review, updating hand drawn figures, and bringing formatting in accordance with current SAE standards.

ARP5448/6A has been reaffirmed to comply with the SAE Five-Year Review policy.

FOREWORD

The Airframe Control Bearing Group (ACBG-1) prepared this ARP as a conversion of draft military standard MIL-STD-2159-6 into SAE ARP document format.

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1. SCOPE

1.1 Purpose

This method outlines a standard procedure for performing conformity tests of bearings utilizing liners of bonded polytetrafluoroethylene (PTFE). The data from these tests shall be used to determine if the product meets the conformity requirements of the applicable specification.

1.2 Classification

Bearings covered by this test method shall be spherical bearings with either fabric or fabric composite liners containing PTFE (Type I), or with molded PTFE material (Type II).

2. REFERENCES

There are no referenced publications specified herein.

2.1 Definitions

CONFORMITY: The characteristic of a spherical bearing which describes the relationship between the spherical surface of the ball and the spherical inner surface of the race.

3. GENERAL REQUIREMENTS

3.1 Test Apparatus

The following items shall be used for this examination.

- a. Self-setting, metallurgical mounting resin.
- b. Abrasive paper (180, 240, 320, 400, and 600 grit sizes).
- c. Metal scribe.
- d. Optical comparator or toolmaker's microscope.
- e. Metallurgical mounting mold.

4. DETAILED REQUIREMENTS

4.1 Encapsulation

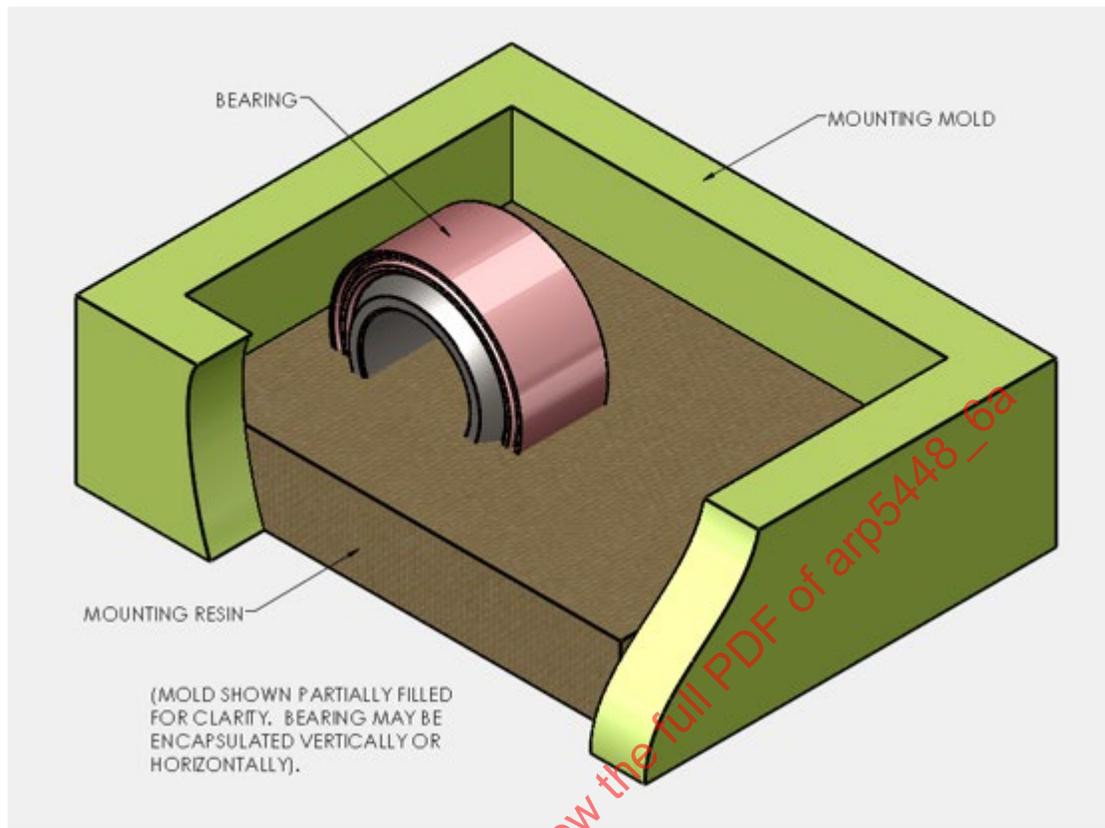
4.1.1 Material

Bearing assemblies to be sectioned shall be encapsulated in an appropriate plastic material, as used in metallurgical mounts, to prevent motion of the ball relative to the race.

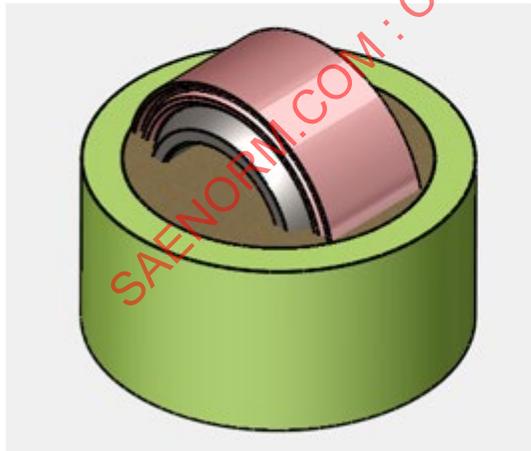
4.1.2 Mount Mold

Before mixing plastic mounting resin, center bearing in an appropriate size mount mold, which should be large enough such that the bearing will be approximately 50% enveloped in mounting compound. The mold and bearing shall be placed on a glass slab or equivalent hard flat surface (see Figure 1, Method A). It may be necessary to install some bearings in a retaining ring prior to mounting to eliminate a potential spring back of the bearing race (see Figure 1, Method B).

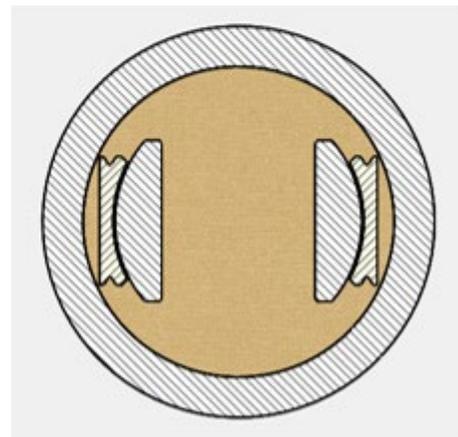
A. OPEN MOLD METHOD



B. CAPTURED RACE METHOD



POTTING THE BEARING
(RESIN LEVEL TO BE ABOVE THE BEARING
CENTERLINE .25" MIN.)



SPECIMEN BEARING AFTER SECTIONING

Figure 1 - Mounting methods

4.1.3 Setup

Bearings manufactured with radial free play shall have an appropriate thickness of shim stock inserted between the ball and outer ring to force the ball radially against the outer ring at the point diametrically opposite the shim. The bearing shall then be encapsulated in plastic mounting material, sectioned along the diameter through the ball/race contact point, and inspected as above.

4.1.4 Mounting Compound

Mix mounting compound in accordance with the manufacturer's recommendation. The consistency of the compound shall be such that it flows smoothly, minimizing the presence of air pockets or voids in the mount. Slowly pour resin into mold until bearing is covered as shown in Figure 1. Allow to stand undisturbed for the recommended cure time.

4.2 Sectioning

4.2.1 Sectioning for Normal Conformity Inspection

The bearing shall be cut on a diameter and normal to the race side faces to produce a surface as in Figure 2 for Type I spherical bearings, or as in Figure 3 for Type II spherical bearings. The bearings shall be flooded constantly with coolant to prevent mounting resin from softening. The mounted bearing shall be sectioned as shown in Figure 4, allowing approximately 0.010 inches for final preparation. A sharp scribe point, or other pointed metal pick, shall be used to clean metal smear from race/ball interface caused by sawing.

4.2.2 Sectioning for Circumferential Conformity Inspection

For Type II spherical bearings with molded PTFE material, the mounted bearings shall be sectioned as shown in Figure 5, allowing approximately 0.010 inches for final preparation. The bearing shall be cut on a diameter and parallel to the race side faces to produce a surface as shown in Figure 6. The bearing shall be flooded constantly with coolant to prevent mounting resin from softening. A sharp scribe point, or other pointed metal pick, shall be used to clean metal smear from race/ball interface caused by sawing.

4.3 Polishing

The bearing shall be rough sanded and polished to a true diameter to facilitate accurate measurement of the race/ball interface.

4.4 Inspection

4.4.1 Normal Conformity of Type I and Type II Spherical Bearings

By use of an optical comparator, toolmaker's microscope, or other suitably accurate technique, measure dimension "t" radially from the ball to the outer race as shown in Figures 2 or 3. The normal conformity must meet the applicable specification requirements.

4.4.2 Circumferential Conformity of Type II Spherical Bearings

By use of an optical comparator or other suitably accurate technique, measure dimension "d" radially from the center of the bore at a minimum of eight uniformly spaced positions as shown in Figure 6. Circumferential conformity shall meet the applicable specification requirements.

	LOCATION	SAMPLE NUMBER				
		1	2	3	4	5
t [in]	A					
	B					
	C					
	D					
	E					

H	
H/10	

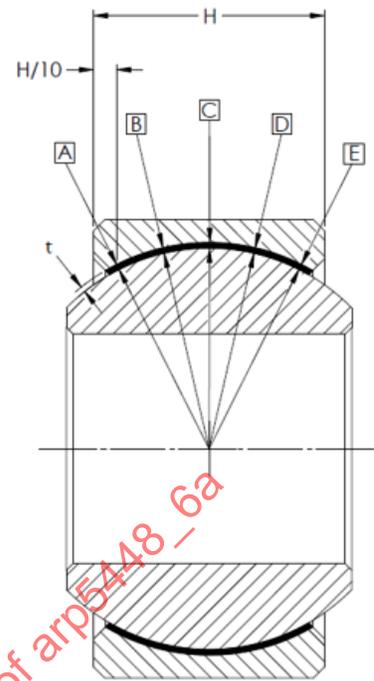


Figure 2 - Normal conformity Type I bearing

	LOCATION	SAMPLE NUMBER				
		1	2	3	4	5
t [in]	A					
	B					
	C					
	D					
	E					

H	
H/10	

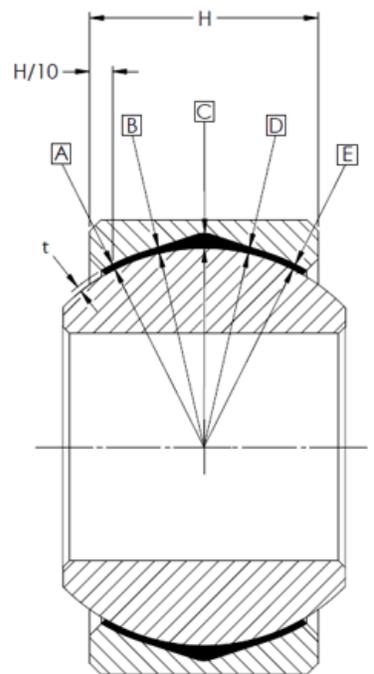


Figure 3 - Normal conformity Type II bearing

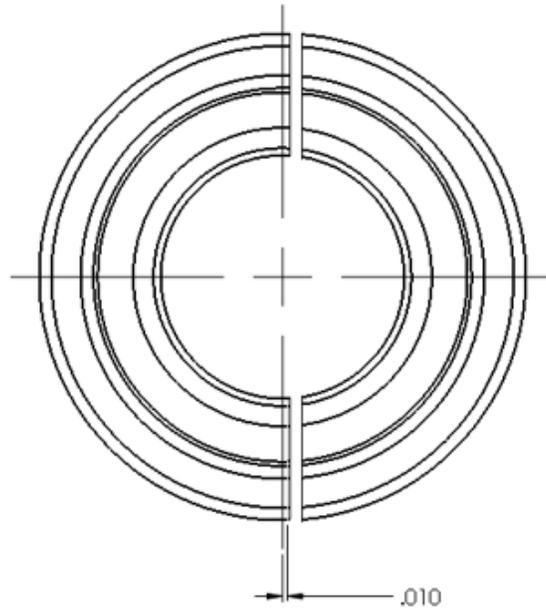


Figure 4 - Sectioning bearing for normal conformity inspection

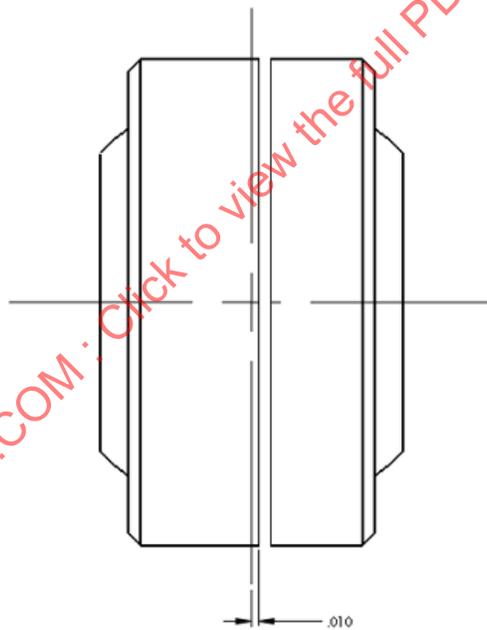


Figure 5 - Sectioning bearing for circumferential conformity inspection