

Peening Media
Hardened Steel Peening Balls

RATIONALE

AMS2431/5B results from a Five Year Review and update of this specification.

1. SCOPE

1.1 The complete requirements for procuring the product shall consist of this document and the latest issue of the basic specification, AMS2431.

1.2 Application

Peening balls conforming to this specification are typically intended for use in peening metal surfaces to impart compressive stresses to these surfaces thereby increasing resistance to fatigue and stress-corrosion cracking. Generally, peening balls, because they are available in much larger sizes than cast steel or cut wire shot, are used where very high intensities are required to produce a very deep compressive layer. Peening balls are also frequently used in the peen forming process.

1.3 Classification

Peening media covered by this specification is classified as follows:

Type 1 - Case hardened balls for saturation peening and peen forming

Type 2 - Through hardened balls for peen forming only

1.3.1 Type 1 peening media shall be used unless otherwise specified.

2. APPLICABLE DOCUMENTS

See AMS2431. The issue of the following document in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

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on this Technical Report, please visit
<http://www.sae.org/technical/standards/AMS2431/5B>**

2.1 International Organization for Standardization Publications

Available from <http://www.iso.org/iso/store.htm>.

DIN ISO 683-17 Heat-treated steels, alloy steels and free-cutting steels - Part 17: Ball and roller bearing steels

3. TECHNICAL REQUIREMENTS

3.1 Type 1 peening media - case hardened peening balls

3.1.1 Peening balls shall conform to AMS2431 and the requirements specified herein.

3.1.2 Composition shall conform to AISI 1022 or similar steels of lower carbon content.

3.1.2.1 Surface shall be carburized and surface hardness shall be 636 to 739 HV (57 to 62 HRC) or equivalent.

3.1.2.2 Case depth shall be in accordance with Table 1.

3.1.3 Balls shall be clean and free of dirt, grit, oil, or grease.

3.1.4 Microstructure - Case shall be normal carburized microstructure, free from grain boundary ferrite and cementite

3.2 Type 2 peening media - through hardened peening balls

3.2.1 Peening balls shall conform to AMS2431 and the requirements specified herein.

3.2.2 Composition shall conform to DIN_EN_ISO_683_17 group (a), through hardened bearing steels

3.2.3 Hardness shall be 636 to 739 HV (57 to 62 HRC) or equivalent. Hardness values exceeding 63 HRC are permitted if acceptable to the customer and specified at time of order.

3.2.4 Balls shall be clean and free of dirt, grit, oil, or grease.

3.3 Workmanship

3.3.1 Shape

Peening balls shall be essentially spherical with no sharp edges or malformed product. Small surface flats, cuts and pits are acceptable.

3.4 Size

Type 1 and Type 2 Peening balls shall conform to the requirements of Table 1.

3.5 Test Methods and Procedures

3.5.1 Composition shall be determined in accordance with ASTM A 751.

3.5.2 Hardness shall be determined in accordance with ASTM E 384.

TABLE 1 - PEENING BALLS

Nominal Size	Minimum Case Depth Inch	Minimum Case Depth Millimeters	Maximum Case Depth Inch	Maximum Case Depth Millimeters	Size Tolerance plus and minus Inch	Size Tolerance plus and minus Millimeter
	Type 1	Type 1	Type 1	Type 1	Type 1&2	Type 1&2
APB 3/32	0.020	0.51	0.025	0.64	0.008	0.20
APB 1/8	0.025	0.64	0.030	0.76	0.010	0.25
APB 3/16	0.030	0.76	0.035	0.89	0.010	0.25
APB 7/32	0.035	0.89	0.040	1.02	0.010	0.25
APB 1/4	0.045	1.14	0.055	1.40	0.010	0.25
APB 3/8	0.055	1.40	0.065	1.65	0.010	0.25
APB 7/16	0.065	1.65	0.075	1.90	0.010	0.25

4. QUALITY ASSURANCE PROVISIONS

See AMS2431 and the following:

4.1 Sampling

Two samples of approximately 800 grams each shall be selected from separate containers chosen at random. Each sample shall be split to the following test quantities.

4.1.1 Composition

Not less than two samples from each shipment.

4.1.2 Hardness

Twenty microhardness readings using a 500 gram load shall be made from each sample with no more than one impression from any single ball.

4.1.2.1 Samples for hardness testing shall be prepared as for microhardness testing by encapsulating a single layer of balls in a plastic mount and polishing down to nominal half spheres. For Type 1 case hardened steels, case microhardness at 0.002 and 0.003 inch (0.05 and 0.08 mm) depth shall be equivalent to 636 to 739 HV (57 to 62 HRC). Core hardness shall not exceed 383 HV (40 HRC), or equivalent.

4.1.2.2 For Type 2 through hardened steels, hardness to be 636 to 739 HV (57 to 62HRC) or equivalent. Hardness values in excess of 63 HRC are permitted, if acceptable to the customer and specified at time of order.

4.1.3 Microstructure

The sample population used for hardness testing shall also be used for microstructure evaluation.

4.1.4 For Type 1, case depth shall be determined visually by measurement on microhardness sample using a 3 to 5% nital etch. Not less than 90% of sample shall meet case depth values of Table 1.

4.1.5 Size

Two representative samples of 30 balls shall be measured with standard micrometer.

4.1.6 Shape shall be determined visually from randomly selected sample of approximately 100 balls.