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AEROSPACE MATERIAL SPECIFICATION

AMS 2431/5

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Submitted for recognition as an American National Standard

PEENING MEDIA
Case Hardened Steel Peening Balls

1. SCOPE: This specification, in conjunction with the general requirements covered in AMS 2431, establishes the requirements for peening balls to be used for peening of metal parts.

2. APPLICABLE DOCUMENTS: See AMS 2431.

3. TECHNICAL REQUIREMENTS:

3.1 Peening balls shall conform to AMS 2431 and the requirements specified herein.

3.2 Composition: Shall conform to AISI 1022 or similar steels of lower carbon content.

3.2.1 Surface: Shall be carburized and surface hardness shall be 636 - 739 HV (57 - 62 HRC).

3.2.2 Case Depth: Shall be in accordance with Table 1.

3.2.3 Contamination: Balls shall be clean and free of dirt, grit, oil, or grease.

3.4 Workmanship:

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

3.4.2 Microstructure: Case shall be normal carburized microstructure, free from grain boundary ferrite and cementite.

3.5 Size: Peening balls shall conform to the requirements of Table 1.

3.6 Test Methods and Procedures:

3.6.1 Composition: Shall be determined in accordance with ASTM A751.

3.6.2 Hardness: Shall be determined in accordance with ASTM E384.

4. QUALITY ASSURANCE PROVISIONS: See AMS 2431 and the following:

4.1 Sampling: Two samples of 800 g 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 shall be made from each sample with no more than one impression from any single shot.

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

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

4.1.4 Case Depth: Shall be determined visually by measurement on microhardness sample using a 3 - 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,

5. PREPARATION FOR DELIVERY: See AMS 2431 and the following:

5.1 Packaging and Identification: Peening balls shall be packaged in 80 pounds (36 kg) boxes.

6. ACKNOWLEDGMENT: See AMS 2431.

7. REJECTIONS: See AMS 2431.

8. NOTES: See AMS 2431 and the following:

8.1 Intended Use: Peening balls conforming to this specification are 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.