SAE Aerospace
An SAE International Group

AEROSPACE MATERIAL SPECIFICATION

SAE AMS2431 REV. C

Issued 1998-04
Revised 2010-10

Superseding AMS2431B

Peening Media
General Requirements

RATIONALE

AMS2431 was issued to ensure the rounding method for reporting data and product acceptance is used in accordance with ASTM E 29.

1. SCOPE

1.1 This specification and its supplementary detail specifications cover the requirements for media to be used in controlled shot peening of metal parts.

1.2 Reference to AMS2431 with the appropriate slash number on a purchase order constitutes a requirement to conform to the applicable specification in 2.1.

2. APPLICABLE DOCUMENTS

The issue of the following documents 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.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

AMS2431/1 Peening Media (ASR), Cast Steel Shot, Regular Hardness (45 to 52 HRC)

AMS2431/2 Peening Media (ASH), Cast Steel Shot, High Hardness (55 to 62 HRC)

AMS2431/3 Peening Media (AWCR), Conditioned Carbon Steel Cut Wire Shot, Regular Hardness (45 to 52 HRC)

AMS2431/4 Peening Media (AWS), Conditioned Stainless Steel Cut Wire Shot

AMS2431/5 Peening Media, APB Case Hardened Steel Peening Balls

AMS2431/6 Peening Media, APB Glass Shot

AMS2431/7 Peening Media, AZB Ceramic Shot

AMS2431/8 Peening Media (AWCH), Conditioned Carbon Steel Cut Wire Shot, High Hardness (55 to 62 HRC)

SAE J441 Cut Wire Shot

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: http://www.sae.org

SAE J444 Cast Shot and Grit Size Specifications for Peening and Cleaning

SAE J445 Metallic Shot and Grit Mechanical Testing

SAE J827 High-Carbon Cast-Steel Shot

SAE J1173 Size Classification and Characteristics of Glass Beads for Peening

SAE J1830 Size Classification and Characteristics of Ceramic Shot for Peening

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM E 29 Using Significant Digits in Test Data to Determine Conformance with Specifications

ASTM B 214 Sieve Analysis of Granular Metal Powders

ASTM C 169 Chemical Analysis of Soda-Lime and Borosilicate Glass

ASTM E 11 Wire-Cloth Sieves for Testing Purposes

ASTM E 18 Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials

ASTM E 140 Hardness Conversion Tables for Metals (Relationship Between Brinell Hardness, Vickers Hardness, Rockwell Hardness, Rockwell Superficial Hardness, and Knoop Hardness)

ASTM E 350 Chemical Analysis of Carbon Steel, Low-Alloy Steel, Silicon Electrical Steel, Ingot Iron, and Wrought Iron

ASTM E 353 Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron Alloys

ASTM E 384 Microhardness of Materials

3. TECHNICAL REQUIREMENTS

3.1 Detail Specification

The requirements for a specific product shall consist of all requirements specified herein in addition to requirements specified in the applicable detail specification. In case of conflict between requirements of this basic specification and the applicable detail specification, requirements of the detail specification shall govern.

3.2 Quality

Peening media, as received by purchaser, shall be uniform in quality and condition, clean, and free from foreign materials and from imperfections detrimental to usage of the peening media.

3.3 Test Methods

3.3.1 Composition shall be determined in accordance with ASTM C 169, ASTM E 350, or ASTM E 353.

3.3.2 Hardness shall be determined in accordance with ASTM E 18 or ASTM E 384 for metallic shot and as described in the applicable detail specification for nonmetallic peening media. Conversion to Rockwell C values shall be in accordance with ASTM E 140.

3.3.3 Quality shall be determined visually and in accordance with the applicable detail specification(s).

3.3.4 Size shall be determined in accordance with ASTM E 11, ASTM B 214, and the applicable detail specification.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The supplier of peening media shall supply all samples for supplier's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the peening media conforms to specified requirements.

4.2 Classification of Tests

All technical requirements are acceptance tests and shall be performed on each lot.

4.3 Sampling for testing shall be in accordance with the applicable detail specification; a lot shall consist of peening media of the same nominal alloy or composition, condition, size, and hardness. If production is continuous, a lot shall be the product of not more than eight hours. Alternatively, Statistical Process Control methods may be used to monitor the quality of the product so that it meets the requirements of the applicable detail specification.

4.4 Reports

The supplier of peening media shall furnish with each shipment a report stating that the media conforms to the size distribution, number of marginal/defective shapes, density, chemical composition, hardness, and other technical requirements and the applicable detail specification. This report shall include the purchase order number, lot number, code letters, size, quantity, and AMS2431C, including the applicable detail specification number.

For purposes of determining conformance with this specification and those listed in 2.1, an observed value or a calculated value shall be rounded "to the nearest unit" in the last right-hand digit used in expressing the specification maximum or minimum limit in accordance with the rounding method of ASTM E 29.

4.5 Records

All manufacturing records and all records of testing and inspection shall be retained and available for inspection for not less than two years after manufacture. The records shall contain all data, including statistical process control reports, necessary to verify conformance to the requirements of this specification and the applicable detail specification.

5. PREPARATION FOR DELIVERY

5.1 Identification

Each container of peening media shall be permanently and legibly marked with not less than the following information:

Manufacturer and address
Description of peening media (cast steel, cut wire, etc)
Peening media hardness, if applicable (equivalent HRC for steel shot)
Specification number, code, and size
Lot number
Example of line 4: "AMS2431/1C - ASR170" (See Table 1).

TABLE 1 - PEENING MEDIA AND IDENTIFICATION CODES

Specification	Description	Code
AMS2431/1	Cast Steel Shot, Regular Hardness (45 to 52 HRC)	ASR
AMS2431/2	Cast Steel Shot, High Hardness (55 to 62 HRC)	ASH
AMS2431/3	Conditioned Carbon Steel Cut Wire Shot, Regular Hardness (45 to 52 HRC)	AWCR
AMS2431/4	Conditioned Stainless Steel Cut Wire Shot	AWS
AMS2431/5	Peening Balls	APB
AMS2431/6	Glass Shot	AGB
AMS2431/7	Ceramic Shot	AZB
AMS2431/8	Conditioned Carbon Steel Cut Wire Shot, High Hardness (55 to 62 HRC)	AWCH

5.2 Packaging

Peening media shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the peening media to ensure carrier acceptance and safe delivery.

5.2.1 Packaging containers shall be tightly sealed and impermeable to moisture to prevent deterioration of product.

6. ACKNOWLEDGMENT

A supplier shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

7. REJECTIONS

Peening media not conforming to this specification or the applicable detail specification, or to modifications authorized by purchaser, will be subject to rejection.

8. NOTES

8.1 A change bar (l) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of this document. An (R) symbol to the left of the document title indicates a complete revision of the document, including technical revisions. Change bars and (R) are not used in original publications, nor in documents that contain editorial changes only.

8.2 Terms used in AMS are clarified in ARP1917 and as follows:

8.2.1 Parts

Finished or semifinished metal parts.

8.2.2 Peening Media

Spherical or quasi-spherical material used in the controlled shot peening process. See Table 1 for descriptions, specifications, and codes.

8.2.3 Cognizant Engineering Organization is the term applied to the engineering organization responsible for the design of the parts or a designee of this organization.

8.3 Dimensions and properties in inch/pound units and the Fahrenheit temperatures are primary; dimensions and properties in SI units and the Celsius temperatures are shown as the approximate equivalents of the primary units and are presented only for information.

8.4 Durability and Transmitted Peening Energy

Testing in accordance with SAE J445 is recommended as a means of comparing the quality of peening media. Durability should be measured by the number of cycles required for 100% replacement (by weight). Transmitted peening energy can be determined from the test strip arc height after exposure to 40 cycles. Manufacturers of peening media should furnish results of such test for their media.

8.5 Purchase documents should specify not less than the following:

AMS2431C
Quantity of product required
Size of container
Type of media with applicable slash number (See Table 1)
Size of media.

8.6 Similar Specifications

This specification used in conjunction with the detail specification for the media in Table 1 meets or exceeds the minimum technical requirements of MIL-G-9954, MIL-S-851, MIL-S-13165, SAE J441, SAE J444, SAE J827, SAE J1173, and SAE J1830. In areas of disagreement, the requirements of this specification shall govern.

PREPARED BY AMS COMMITTEE "B" AND AMEC-SE