AEROSPACE MATERIAL SPECIFICATION

AMS2431™/4	REV. E

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Superseding AMS2431/4D

Peening Media
Conditioned Stainless Steel Cut Wire Shot (AWS)

RATIONALE

AMS2431/4E results from a Five-Year Review and update of this specification with changes to Purpose (see 1.1); Hardness (see 3.3); Tables 3, 4, and 5; Size (see 3.8.1.2); Composition (see 4.1.1); and Packaging and Identification (see 5.1.1).

1. SCOPE

1.1 Purpose

This specification, in conjunction with the general requirements for peening media covered in AMS2431, establishes the requirements for the procurement of conditioned stainless steel cut wire shot.

1.2 Application

Conditioned stainless steel cut wire shot conforming to this specification is intended for use in peening metal surfaces to impart compressive stresses to these surfaces thereby increasing resistance to fatigue and stress-corrosion cracking. Generally, conditioned stainless steel cut wire shot is used on parts where ferrous contamination is undesirable and a media of high durability is required.

2. APPLICABLE DOCUMENTS

Refer to AMS2431.

3. TECHNICAL REQUIREMENTS

3.1 Conditioned stainless steel cut wire shot shall conform to AMS2431, and the requirements specified herein.

3.2 Composition

Composition shall conform to the percentages by weight for stainless steel shown in Table 1, determined in accordance with ASTM E353 and ASTM E1019.

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https://www.sae.org/standards/content/AMS2431/4E/

Table 1 - Composition

Element	Min	Max
Carbon	--	0.15
Manganese	--	2.00
Silicon	--	1.00
Phosphorus	--	0.045
Sulfur	--	0.030
Chromium	17.00	20.00
Nickel	8.00	10.50

3.3 Hardness

Not less than 90% of the readings shall be 45 HRC minimum, or equivalent, determined in accordance with ASTM E384 using a 500 g minimum load. Hardness testing shall be performed after the shot has been conditioned for shape.

3.4 Media Condition

Conditioned cut wire shot shall be free of shear cracks and burrs.

3.5 Contamination

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

3.6 Quality Requirements

Shot shall conform to 3.6.1, determined in accordance with 3.8.2.

3.6.1 Shape shall be predominantly spherical as a result of conditioning or rounding.

3.6.1.1 Acceptable Shapes

Shapes conforming to Figure 1 shall be in accordance with Table 2.

3.6.1.2 Marginal Shapes

Shapes conforming to Figure 2 are permissible to the extent specified in Table 2.

3.6.1.3 Unacceptable Shapes

Shapes conforming to Figure 3 are permissible to the extent specified in Table 2.

Table 2 - Shape requirements

Shot Size	Area per Field Square Inches (mm²)	Number of Fields Viewed	Number of Marginal Particles All Fields Max(1)	Number of Unacceptable Particles All Fields Max(2)
AWS 116	1 (645)	3	7	2
AWS 96	1 (645)	2	7	2
AWS 80	1 (645)	2	10	2
AWS 62	1 (645)	9	63	2
AWS 54	1 (645)	7	66	2
AWS 47	1 (645)	5	68	2
AWS 41	1 (645)	4	70	2
AWS 35	0.25 (161)	14	67	2
AWS 32	0.25 (161)	12	60	2
AWS 28	0.25 (161)	7	67	2
AWS 23	0.25 (161)	5	70	2
AWS 20	0.25 (161)	4	76	2
AWS 17	0.0625 (40)	11	70	2
AWS 14	0.0625 (40)	6	60	2
AWS 12	0.0625 (40)	5	68	2
AWS 7	0.0625 (40)	2	82	2

(1) Maximum number of marginal shapes is approximately 3% of the total number of particles viewed.
(2) Maximum number of unacceptable shapes is approximately 0.1% of the total number of particles viewed.

3.6.2 Conditioning is accomplished by impacting the as-cut wire cylinders against a hardened target until a predominantly spherical shape (see Figure 1) has been obtained.

3.7 Size

Size shall conform to the requirements of Table 3, 4, or 5, determined in accordance with 3.8.1.

Table 3 - Size requirements, 50-piece sample

Shot Size	Wire Diameter Inches	Wire Diameter Millimeters	Weight of 50 Pieces Grams
AWS 116	0.116 ± 0.002	2.946 ± 0.05	5.77 to 7.05
AWS 96	0.096 ± 0.002	2.438 ± 0.05	3.45 to 4.25
AWS 80	0.080 ± 0.002	2.032 ± 0.05	2.09 to 2.55
AWS 62	0.0625 ± 0.002	1.588 ± 0.05	0.98 to 1.20
AWS 54	0.054 ± 0.002	1.37 ± 0.05	0.65 to 0.79
AWS 47	0.047 ± 0.002	1.19 ± 0.05	0.43 to 0.52
AWS 41	0.041 ± 0.002	1.04 ± 0.05	0.28 to 0.35
AWS 35	0.035 ± 0.001	0.89 ± 0.025	0.18 to 0.22
AWS 32	0.032 ± 0.001	0.81 ± 0.025	0.12 to 0.16
AWS 28	0.028 ± 0.001	0.71 ± 0.025	0.09 to 0.11
AWS 23	0.023 ± 0.001	0.58 ± 0.025	0.045 to 0.060
AWS 20	0.020 ± 0.001	0.51 ± 0.025	0.035 to 0.045

Table 4 - Size requirements, 100-piece sample

Shot Size	Wire Diameter Inches	Wire Diameter Millimeters	Weight of 100 Pieces Grams
AWS 17	0.017 ± 0.001	0.43 ± 0.025	0.040 to 0.055
AWS 14	0.014 ± 0.001	0.36 ± 0.025	0.015 to 0.030
AWS 12	0.012 ± 0.001	0.30 ± 0.025	0.010 to 0.020

Table 5 - Size requirements, 200-piece sample

Shot Size	Wire Diameter Inches	Wire Diameter Millimeters	Weight of 200 Pieces Grams
AWS 7	0.007 ± 0.0005	0.177 ± 0.0125	0.0047 to 0.0078

3.8 Test Methods and Procedures

3.8.1 Size

3.8.1.1 The size of shot shall be determined by comparing a wire with a diameter as specified in Table 3, 4, or 5 with the shot.

3.8.1.2 Fifty pieces of the conditioned media shall meet the weight requirements as shown in Table 3. One hundred pieces of the conditioned media shall meet the weight requirements of Table 4. Two hundred pieces of the conditioned media shall meet the weight requirements of Table 5.

3.8.2 Shape

Visual examination, at a minimum of 10X magnification for sizes AWS 23 and larger and at a minimum of 30X magnification for sizes finer than AWS 23, shall be performed using the Areas of Field and Number of fields specified in Table 2 for each respective shot size.

4. QUALITY ASSURANCE PROVISIONS

Shall be in accordance with AMS2431 and the following:

4.1 Sampling and Testing

Two samples of approximately 800 g each shall be selected from separate containers chosen at random from each lot. Each sample shall be split to test quantities as follows:

4.1.1 Composition

Each of the two samples shall be evaluated.

4.1.2 Hardness

Not less than 20 microhardness readings shall be made from each sample with no more than one impression on any one shot.

4.1.2.1 Samples for microhardness testing shall be prepared by encapsulating a representative amount of shot from each sample in a plastic mount and polishing down to nominal half spheres.

4.1.3 Size

Not less than 100 g from each sample shall be used for size evaluation.

4.1.3.1 Alternative methods for size evaluation may be used provided that they can be correlated to the weight method in 3.8.1.2 and are acceptable to the cognizant engineering organization.

4.1.4 Shape

Each sample shall consist of shot, in one layer, which completely fills the areas specified in Table 2. The number of fields, viewed at magnification for each shot size, shall be as indicated in Table 2.