

Peening Media (AWS)  
Conditioned Stainless Steel Cut Wire Shot

RATIONALE

AMS 2431/4B is a Five Year Review and update of this specification.

1. SCOPE

1.1 Purpose

The complete requirements for procuring the product shall consist of this document and the latest issue of the basic specification, AMS 2431.

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

See AMS 2431.

3. TECHNICAL REQUIREMENTS

3.1 Conditioned stainless steel cut wire shot shall conform to AMS 2431 and the requirements specified herein.

3.2 Composition shall conform to the percentages by weight shown in paragraph 5.2 of SAE J441 (For reference only, see Table 1), and shall be determined in accordance with ASTM E 353.

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

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3.3 Hardness shall be 45 HRC minimum, or equivalent, measured in accordance with ASTM E 384 using a 500 gram minimum load for not less than 90% of the readings. Hardness testing shall be performed after the shot has been conditioned for shape.

### 3.4 Wire Quality

Shot shall be manufactured from wire that is free from shear cracks and laps and shall not contain excessive seams or burrs.

### 3.5 Weight

Fifty pieces of the conditioned media shall conform to Table 3; 100 pieces of the media shall conform to Table 4.

### 3.6 Contamination

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

### 3.7 Quality Requirements

Shot shall conform to 3.7.1, 3.7.2, 3.7.3, and 3.7.4, determined in accordance with 3.9.2.

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

#### 3.7.2 Acceptable Shapes

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

#### 3.7.3 Marginal Shapes

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

#### 3.7.4 Unacceptable Shapes

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

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

3.8 Size shall conform to the requirements of Table 3 and Table 4, determined in accordance with 3.9.1.

TABLE 2 - SHAPE REQUIREMENTS

Shot Size	Area per Field Square Inch (mm <sup>2</sup> )	Number of Fields Viewed	Number of Marginal Particles All Fields max(1)	Number of Unacceptable Particles All Fields max(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

Notes: (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.

TABLE 3 - SIZE REQUIREMENTS

Shot Size	Wire Diameter Inch	Wire Diameter Millimeters	Weight of 50 Pieces Grams
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

Shot Size	Wire Diameter Inch	Wire Diameter Millimeter	Weight of 100 Pieces Gram
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

### 3.9 Test Methods and Procedures

#### 3.9.1 Size

The size of shot shall be determined by the use of a wire with a diameter as specified in Table 3. 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.

#### 3.9.2 Shape

Visual evaluation, at a minimum magnification of 10X for sizes CW 23 and larger and a minimum magnification of 30X for sizes finer than CW 23, shall be performed using the areas and number of fields specified in Table 2 for each respective shot size.

## 4. QUALITY ASSURANCE PROVISIONS

See AMS 2431 and the following:

### 4.1 Sampling and Testing

Two samples of approximately 800 grams 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

Not less than two samples from each lot 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 sample of each lot in a plastic mount and polishing down to nominal half spheres.

#### 4.1.3 Size

Two representative samples of not less than 100 grams each shall be used for size evaluation.

4.1.3.1 Alternative methods for size evaluation are permitted provided that they can be correlated to the weight method and are acceptable to purchaser.

#### 4.1.4 Shape

A representative sample shall consist of a number of shot, in one layer, which completely fills the areas specified in Table 2. The number of areas, or fields, viewed at 10X or 30X (See 3.9.2) evaluated for each shot size shall be as indicated in Table 2.

4.1.4.1 Alternative methods of inspection for shape are permitted provided that they can be correlated to the optical method and are acceptable to purchaser.

### 5. PREPARATION FOR DELIVERY

See AMS 2431 and the following:

#### 5.1 Packaging and Identification

Steel shot shall be packaged in 40 to 55 pound (18 to 25 kg) units in plastic coated bags or pails.

### 6. ACKNOWLEDGMENT

See AMS 2431.

### 7. REJECTIONS

See AMS 2431.

### 8. NOTES

See AMS 2431.

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