Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 7735A
Superseding AMS 7735
Issued 11-1-70
Revised 4-15-80

ALLOY WIRE, ROUND
35Pd - 30Ag - 14Cu - 10Au - 10Pt - 0.85Zn

1. SCOPE:

1.1 Form: This specification covers a palladium-silver alloy in the form of round wire.

1.2 Application: Primarily for electrical contacts or bearing surfaces requiring high hardness, low contact resistance, and good corrosion resistance.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM E8 - Tension Testing of Metallic Materials
ASTM E384 - Microhardness of Materials

2.3 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Federal Standards:

Federal Test Method Standard No. 151 - Metals; Test Methods

2.3.2 Military Standards:

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of

3. TECHNICAL REQUIREMENTS:

3.1 Composition: Shall conform to the following percentages by weight, determined by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other analytical methods approved by purchaser:

	min	max
Palladium	34.0	36.0
Silver	29.0	31.0
Copper	13.5	14.5
Gold	9.5	10.5
Platinum	9.5	10.5
Zinc	0.5	1.2
Other Elements, total	--	0.1

3.2 Condition: Solution heat treated.

3.3 Properties: Wire shall conform to the following requirements; tensile testing shall be performed in accordance with ASTM E8 and hardness testing shall be performed in accordance with ASTM E384:

3.3.1 As Solution Heat Treated:

3.3.1.1 Tensile Properties: Shall be as specified in Table I.

TABLE I

Nominal Diameter Inch	Tensile Strength psi	Elongation % in 2 in.
0.004 to 0.020, incl	110,000 - 135,000	20 - 40
Over 0.020 to 0.040, incl	100,000 - 125,000	15 - 35
Over 0.040 to 0.080, incl	95,000 - 120,000	15 - 35

TABLE I (SI)

Nominal Diameter Millimetres	Tensile Strength MPa	Elongation % in 50 mm
0.10 to 0.50, incl	758 - 931	20 - 40
Over 0.50 to 1.00, incl	690 - 862	15 - 35
Over 1.00 to 2.00, incl	655 - 827	15 - 35

3.3.1.2 Hardness:

Nominal Diameter		Knoop Hardness
Inch	(Millimetres)	
0.004 to 0.005, incl	(0.10 to 0.13, incl)	200 - 250 HK/50
Over 0.005 to 0.010, incl	(Over 0.13 to 0.25, incl)	200 - 250 HK/100
Over 0.010 to 0.080, incl	(Over 0.25 to 2.00, incl)	210 - 260 HK/100

3.3.2 After Precipitation Heat Treatment: Wire shall have the following properties after being precipitation heat treated by heating to 900°F ± 10 (480°C ± 5), holding at heat for 45 min. ± 5, and cooling in air to room temperature:

3.3.2.1 Tensile Properties: Shall be as specified in Table II.

TABLE II

Nominal Diameter Inch	Tensile Strength psi	Elongation % in 2 in.
0.004 to 0.020, incl	165,000 - 205,000	2 - 10
Over 0.020 to 0.040, incl	160,000 - 195,000	1 - 10
Over 0.040 to 0.080, incl	155,000 - 190,000	1 - 10

TABLE II (SI)

Nominal Diameter Millimetres	Tensile Strength MPa	Elongation % in 50 mm
0.10 to 0.50, incl	1138 - 1413	2 - 10
Over 0.50 to 1.00, incl	1103 - 1345	1 - 10
Over 1.00 to 2.00, incl	1069 - 1310	1 - 10

3.3.2.2 Hardness:

Nominal Diameter		Knoop Hardness
Inch	(Millimetres)	
0.004 to 0.005, incl	(0.10 to 0.13, incl)	350 - 410 HK/50
Over 0.005 to 0.040, incl	(Over 0.13 to 1.00, incl)	350 - 410 HK/100
Over 0.040 to 0.080, incl	(Over 1.00 to 2.00, incl)	340 - 400 HK/100

3.4 Quality: Wire, as received by purchaser, shall be uniform in quality and condition, sound, and Ø free from foreign materials and from internal and external imperfections detrimental to usage of the wire.

3.5 Tolerances: Unless otherwise specified, tolerances shall conform to the following:

3.5.1 Diameter: Wire shall be supplied in diameters of 0.004 to 0.080 in. (0.10 to 2.00 mm), incl, and to the diameter tolerances shown in Table III, 3.5.2, and 3.5.3.

TABLE III

Nominal Diameter Inch	Tolerance, Inch plus and minus
0.004 to 0.010, incl	0.0001
Over 0.010 to 0.020, incl	0.0002
Over 0.020 to 0.030, incl	0.0003
Over 0.030 to 0.040, incl	0.0004
Over 0.040 to 0.080, incl	0.0005

TABLE III (SI)

Nominal Diameter Millimetres	Tolerance, Millimetre plus and minus
0.10 to 0.25, incl	0.003
Over 0.25 to 0.50, incl	0.005
Over 0.50 to 0.75, incl	0.008
Over 0.75 to 1.00, incl	0.010
Over 1.00 to 2.00, incl	0.013

3.5.2 Roundness: Wire shall not be out-of-round by more than one-half the total tolerance specified in 3.5.1 for the nominal diameter.

3.5.3 Length (Cut Lengths): ±1/4 in. (±6.5 mm) or ±1%, whichever is greater.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of wire shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Results of such tests shall be re- Ø ported to the purhcaser as required by 4.4. Purchaser reserves the right to sample and to perform such confirmatory testing as he deems necessary to ensure that the wire conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to requirements for composition (3.1), tensile Ø properties (3.3.1.1) and hardness (3.3.1.2) as solution heat treated, and tolerances (3.5) are classified as acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Tests to determine conformance to requirements for tensile properties (3.3.2.1) and hardness (3.3.2.2) after precipitation heat treatment are classified as periodic tests and Ø shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

4.3 Sampling: Shall be in accordance with the following; a lot shall be all wire of the same nominal Ø diameter from the same heat of alloy processed at the same time and presented for vendor's inspection at one time:

Ø 4.3.1 Composition: One sample from each heat.

Ø 4.3.2 Tensile Properties, Hardness, and Tolerances: Not less than one sample from each lot.

4.4 Reports: