SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS7735 | REV. D

Issued 1970-11
Revised 2006-09
Reaffirmed 2012-04

Superseding AMS7735C

Alloy Wire, Round
35Pd - 30Ag - 14Cu - 10Au - 10Pt - 0.85Zn
Solution Heat Treated

(Composition similar to UNS P03300)

RATIONALE

AMS7735D has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE

1.1 Form

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

1.2 Application

This wire has been used typically for electrical contacts or bearing surfaces requiring high hardness, low contact resistance, and good corrosion resistance, but usage is not limited to such applications.

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.

AMS 2750 Pyrometry

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 8 Tension Testing of Metallic Materials
ASTM E 8M Tension Testing of Metallic Materials, Metric
ASTM E 384 Microhardness of Materials

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
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SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AMS7735D

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Table 1, determined by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - COMPOSITION

Element	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:

3.3.1 As Solution Heat Treated

3.3.1.1 Tensile Properties

Shall be as specified in Table 2, determined in accordance with ASTM E 8 or ASTM E 8M.

TABLE 2A - TENSILE PROPERTIES, INCH/POUND UNITS

Nominal Diameter Inch	Tensile Strength ksi	Elongation in 2 Inches %
0.004 to 0.020, incl	110 - 135	20 - 40
Over 0.020 to 0.040, incl	100 - 125	15 - 35
Over 0.040 to 0.080, incl	95.0 - 120	15 - 35

TABLE 2B - TENSILE PROPERTIES, SI UNITS

Nominal Diameter Millimeters	Tensile Strength MPa	Elongation in 50.8 mm %
0.10 to 0.51, incl	758 - 931	20 - 40
Over 0.51 to 1.01, incl	689 - 862	15 - 35
Over 1.01 to 2.03, incl	655 - 827	15 - 35

3.3.1.2 Hardness

Shall be as specified in Table 3, determined in accordance with ASTM E 384:

TABLE 3 - HARDNESS

Nominal Diameter Inch	Nominal Diameter Millimeters	Knoop Hardness
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 2.03, incl	210 - 260 KH/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 (482 °C ± 6), holding at heat for 45 minutes ± 5, and cooling in air to room temperature; pyrometry shall be in accordance with AMS 2750.

3.3.2.1 Tensile Properties

Shall be as specified in Table 4, determined in accordance with ASTM E 8 or ASTM E 8M:

TABLE 4A - TENSILE PROPERTIES, INCH/POUND UNITS

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

TABLE 4B - TENSILE PROPERTIES, SI UNITS

Nominal Diameter Millimeters	Tensile Strength MPa	Elongation in 50.8 mm %
0.10 to 0.51, incl	1138 to 1413	2 - 10
Over 0.51 to 1.02, incl	1103 to 1344	1 - 10
Over 1.02 to 2.03, incl	1069 to 1310	1 - 10

3.3.2.2 Hardness

Shall be as shown in Table 5, determined in accordance with ASTM E 384:

TABLE 5 - HARDNESS

Nominal Diameter Inch	Nominal Diameter Millimeters	Knoop Hardness
0.004 to 0.005, incl	0.10 to 0.13, incl	350 to 410 HK/50
Over 0.005 to 0.040, incl	Over 0.13 to 1.02, incl	350 to 410 HK/100
Over 0.040 to 0.080, incl	Over 1.02 to 2.03, incl	340 to 410 KH/100

3.4 Quality

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

3.5 Tolerances

Shall be as follows:

3.5.1 Diameter

Wire shall be supplied in diameters of 0.004 to 0.080 inch (0.10 to 2.03 mm), inclusive, and to the diameter tolerances shown in Table 6, 3.5.2, and 3.5.3.

TABLE 6A - DIAMETER TOLERANCES, INCH/POUND UNITS

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 6B - DIAMETER TOLERANCES, SI UNITS

Nominal Diameter Millimeters	Tolerance Millimeter plus and minus
0.10 to 0.25, incl	0.003
Over 0.25 to 0.51, incl	0.005
Over 0.51 to 0.76, incl	0.008
Over 0.76 to 1.02, incl	0.010
Over 1.02 to 2.03, 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)

±0.25 inch (±6.4 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 the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the wire conforms to specified requirements.

4.2 Classification of Tests

4.2.1 Acceptance Tests

Composition (3.1), tensile properties (3.3.1.1) and hardness (3.3.1.2) as solution heat treated, and tolerances (3.5) are acceptance tests and shall be performed on each heat or lot as applicable.

4.2.2 Periodic Tests

Tensile properties (3.3.2.1) and hardness (3.3.2.2) after precipitation heat treatment are periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.