AEROSPACE
MATERIAL SPECIFICATIONS
SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York 17, N.Y.

AMS 7726

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Revised

ALLOY WIRE, LOW EXPANSION, GLASS SEALING
53Fe - 29Ni - 17Co

1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.

2. APPLICATION: Primarily for the fabrication of lead wires and other electronic elements to be sealed to hard glasses during the assembly of electronic components.

3. COMPOSITION: Shall be a metallic alloy containing approximately 53% iron, 29% nickel, and 17% cobalt with impurities within the following limits:

Carbon	0.06 max
Manganese	0.50 max
Silicon	0.20 max
Titanium	0.10 max
Aluminum	0.10 max
Magnesium	0.10 max
Zirconium	0.10 max
Ti + Al + Mg + Zr	0.20 max

4. CONDITION: Unless otherwise specified, cold drawn and bright annealed.

5. TECHNICAL REQUIREMENTS:

5.1 Thermal Expansion: The average linear coefficient of thermal expansion, when tested in accordance with ASTM B95-39 shall conform to the following:

Temperature Range, Deg Fahr	Average Linear Coefficient of Thermal Expansion, In. per In. per Deg Fahr
85 to 750	2.50 to 2.80 x 10^{-6}
85 to 840	2.80 to 3.00 x 10^{-6}

5.1.1 Prior to testing, the specimen shall be annealed in a hydrogen atmosphere for 1 hr at 1650 F, followed by 15 min. at 2000 F. Between the 1650 and 2000 F heat treatment periods, the specimen may be cooled to room temperature. The specimen shall be cooled from 2000 to 400 F in the hydrogen atmosphere at a rate not to exceed 9 F per minute.

5.2 Temperature of Transformation: The temperature of transformation from gamma to alpha phase, as determined by means of expansion measurements or metallographic examination, shall be not higher than -112 F. Prior to testing, the specimen shall have been annealed as in 5.1.1.

5.3 Grain Size: Predominantly 5 or finer with occasional grains as large as 3 permissible, ASTM E112-60T.

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5.4 Glass Seal Test: Material shall be capable of producing, with Corning Glass 7052 or equivalent, a glass-to-metal seal free from bubbles. The seal shall be free from cracks after immersion in a mixture of dry ice and acetone maintained at -112 F. Annealing after the sealing operation to relieve stresses in the glass is permissible. When specified by the purchaser, the seal produced in this test shall meet the additional requirements of standards supplied to the manufacturer.

5.5 Hardness: Shall be not higher than Rockwell B 82 or equivalent.

6. QUALITY: Material shall be uniform in quality and condition, sound, and free from foreign materials and from internal and external imperfections, consistent with the type of material involved, detrimental to fabrication or to performance of parts.

7. TOLERANCES: Unless otherwise specified, tolerances shall conform to the following:

7.1 Diameter or Thickness:

Nominal Diameter or Distance Between Parallel Sides Inch	Tolerance, Inch Plus and Minus
0.002 to 0.0043, incl	0.0002
Over 0.0043 to 0.0079, incl	0.00025
Over 0.0079 to 0.0149, incl	0.0003
Over 0.0149 to 0.0199, incl	0.0004
Over 0.0199 to 0.0309, incl	0.0005
Over 0.0309 to 0.0409, incl	0.0006
Over 0.0409 to 0.0609, incl	0.0007
Over 0.0609 to 0.0809, incl	0.0008
Over 0.0809 to 0.1259, incl	0.001
Over 0.1259 to 0.1569, incl	0.0015
Over 0.1569 to 0.250, incl	0.002

7.2 Roundness: Round wire shall not be out-of-round by more than one-half the total tolerance specified in 7.1 for the nominal diameter.

8. REPORTS:

8.1 Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report of the results of tests to determine conformance to the requirements of this specification for each test lot in the shipment. This report shall include the purchase order number, test lot number, material specification number, size, and quantity from each test lot.

8.2 Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number, contractor or other direct supplier of material, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification, and shall include in the report a statement that the material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.