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

AMS 7728B

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ALLOY SHEET AND STRIP, LOW EXPANSION, GLASS SEALING
53Fe - 29Ni - 17Co

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

2. APPLICATION: Primarily for electronic elements to be sealed to hard glasses during assembly of electronic components.

3. COMPOSITION: Shall be a metallic alloy containing approximately 53% iron, 29% nickel, and 17% cobalt with impurities not exceeding the following limits:

Carbon	0.06
Manganese	0.50
Silicon	0.20

3.1 The following impurities shall not exceed the limits shown, but analysis is not required for routine acceptance:

Titanium	0.10
Aluminum	0.10
Magnesium	0.10
Zirconium	0.10
Ti + Al + Mg + Zr	0.20

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

5. TECHNICAL REQUIREMENTS: When ASTM methods are specified for determining conformance to the following requirements, test shall be conducted in accordance with the issue of the ASTM method listed in the latest issue of AMS 2350.

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

Ø Temperature Range, Degrees	Average Linear Coefficient of Thermal Expansion In. per In. per Deg Cent
30 C (86 F) to 400 C (752 F)	$4.60 \text{ to } 5.20 \times 10^{-6}$
30 C (86 F) to 450 C (842 F)	$5.10 \text{ to } 5.50 \times 10^{-6}$

5.1.1 Prior to testing, the specimen shall be annealed in a hydrogen atmosphere for 1 hr at 900 C (1652 F) followed by 15 min. at 1100 C (2012 F). Between the 900 C and 1100 C heat treatment periods, the specimen may be cooled to room temperature. The specimen shall be cooled from 1100 C to 200 C (2012 F to 392 F) in the hydrogen atmosphere at a rate not to exceed 5 C (9 F) per minute.

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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 -78.5 C (-109.3 F). Prior to testing, the specimen shall be annealed as in 5.1.1.

5.3 Grain Size: Predominantly 5 or finer with occasional grains as large as 3 permissible, as determined by comparison of a polished and etched specimen with the chart in ASTM E112.

5.4 Hardness: Shall be not higher than Rockwell B 82 or equivalent for material 0.100 in. and under in thickness and not higher than B 85 or equivalent for material over 0.100 in. in thickness.

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 Thickness: Material over 1 in. wide shall be measured at least 3/8 in. from the edge.

	Tolerance, Inch, Plus and Minus For Width Ranges Shown, Inches			
	Strip		Sheet	
Nominal Thickness Inch	Up to 3, excl	3 to 6, incl	Over 6 to 12, incl	Over 12 to 16, incl
Up to 0.006, excl	0.0005	0.0005	--	--
0.006 to 0.009, incl	0.00075	0.00075	--	--
Over 0.009 to 0.010, incl	0.001	0.001	0.001	0.001
Over 0.010 to 0.011, incl	0.001	0.001	0.001	0.0015
Over 0.011 to 0.016, incl	0.001	0.001	0.0015	0.0015
Over 0.016 to 0.019, incl	0.001	0.001	0.0015	0.002
Over 0.019 to 0.025, incl	0.001	0.0015	0.002	0.002
Over 0.025 to 0.028, incl	0.0015	0.0015	0.002	0.002
Over 0.028 to 0.034, incl	0.0015	0.002	0.0025	0.0025
Over 0.034 to 0.049, incl	0.002	0.0025	0.003	0.003
Over 0.049 to 0.068, incl	0.002	0.003	0.003	0.003
Over 0.068 to 0.099, incl	0.002	0.003	0.003	0.004
Over 0.099 to 0.160, incl	0.002	0.003	0.004	0.004

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.