SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS7724	REV. C

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Superseding AMS7724B

Alloy Sheet and Strip, Sintered Wire Mesh, Corrosion and Heat Resistant 30Fe - 1.5Mn - 21Cr - 20Ni - 20Co - 3.0Mo - 2.5W - 1.0(Cb +Ta) - 0.15N Porous

(Composition similar to UNS R30100)

RATIONALE

AMS7724C has been reaffirmed to comply with the SAE five-year review policy.

NONCURRENT NOTICE

This specification has been declared "NONCURRENT" by the Aerospace Materials Division, SAE, as of October 2001. It is recommended, therefore, that this specification not be specified for new designs.

"NONCURRENT" refers to those materials which have previously been widely used and which may be required on some existing designs in the future. The Aerospace Materials Division, however, does not recommend these as standard materials for future use in new designs. Each of these "NONCURRENT" specifications is available from SAE.

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http://www.sae.org/technical/standards/AMS7724C

1. SCOPE:

1.1 Form:

This specification covers a corrosion and heat resistant iron alloy sintered wire mesh in the form of sheet and strip.

1.2 Application:

Primarily for parts, such as filters and transpiration cooling devices, requiring controlled flow of liquids and gases.

2. APPLICABLE DOCUMENTS:

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

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2248	Chemical Check Analysis Limits, Wrought Corrosion and Heat Resistant Steels and Alloys, Maraging and Other Highly-Alloyed Steels, and Iron Alloys
AMS 2350	Standards and Test Methods
AMS 2371	Quality Assurance Sampling of Corrosion and Heat Resistant Steels and Alloys, Wrought Products Except Forgings and Forging Stock

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 E112	Determining Average Grain Size
ASTM E290	Semi-Guided Bend Test for Ductility of Metallic Materials
ASTM E354	Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys

2.3 U.S. Government Publications:

Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Military Standards:

MIL-STD-163 Steel Mil Products, Preparation for Shipment and Storage

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E354 or by spectrographic or other analytical methods approved by purchaser:

	min	max
Carbon	--	0.10
Manganese	1.00	2.00
Silicon	--	1.00
Phosphorus	--	0.040
Sulfur	--	0.030
Chromium	20.00	22.50
Nickel	19.00	21.00
Cobalt	18.50	21.00
Molybdenum	2.50	3.50
Tungsten	2.00	3.00
Columbium + Tantalum	0.75	1.25
Nitrogen	0.10	0.20
Iron	remainder	

3.1.1 Check Analysis: Composition variations shall meet the requirements of AMS 2248.

3.2 Fabrication:

The product shall be made from one or more layers of wire mesh fabricated into an integral structure by multiple rolling and sintering operations. Wire mesh shall have a smaller number of wires per inch (25 mm) in the warp direction than in the filler direction and shall have weave and wire count selected to yield a product having the required flow rate. Sintering shall be performed in a dry, inert or reducing atmosphere at a temperature which will ensure uniform bonding of the layers without incipient melting.

3.2.1 Requirements for construction will be specified by a series of numbers separated by dashes showing the number of plies, nominal thickness, and the air-flow rate (See 3.4.4); e.g., 2-33-120 will indicate a two-ply product having a nominal thickness of 0.033 in. and an air-flow rate of 120 SCFM per sq ft in inch/pound units and 2-84-366 will indicate a two-ply product having a nominal thickness of 0.84 mm and an air-flow rate of 3.66 m^3/min. per m^2 in SI units.

3.3 Condition:

The product shall be supplied in the as-sintered condition unless the product is cold rolled after the final sintering operation, in which case the product shall be stress relieved by heating in a dry, inert or reducing atmosphere to 2100°F ± 25 (1150°C ± 15), holding at heat for not more than 30 min., and cooing at a rate equivalent to air cool or faster.

3.4 Properties:

The product shall conform to the following requirements; in computing area on which tensile and yield strengths and modulus of elasticity are based, product shall be considered a solid sheet or strip:

3.4.1 Tensile Properties: Shall be as specified in Table I, determined in accordance with ASTM E8:

TABLE I

Construction	Tensile Strength psi, min	Yield Strength at 0.2% Offset psi, min	Elongation in 2 in. %, min
2-39-480	36,000	20,000	10
2-33-120	40,000	22,000	10
5-74-120	45,000	30,000	10

TABLE I (SI)

Construction	Tensile Strength MPa, min	Yield Strength at 0.2% Offset MPa, min	Elongation in 50 mm %, min
2-99-1463	250	140	10
2-84-366	275	150	10
5-188-366	310	205	10

3.4.2 Bending: The product shall withstand, without cracking, bending in accordance with ASTM E290 through an angle of 180 deg around a diameter equal to the bend factor shown below times the nominal thickness of the product with axis of bend parallel to the warp wires on the outside of the bend:

Construction		Bend
Conventional	SI Units	Factor
2-39-480	2-99-1463	3
2-33-120	2-84-366	3
5-74-120	5-188-366	6

3.4.3 Grain Size: Shall be predominantly 3 or finer with occasional grains as large as 1 permissible, determined by comparison of a polished and etched specimen with the chart in ASTM E112.

3.4.4 Flow Rate: Shall be either as specified by the construction code (See 3.2.1) or as otherwise specified on the drawing. Flow rate requirements shall be expressed as SCFM per sq ft (cubic feet of air per minute per square foot under standard atmospheric conditions) or as cubic metres of air per minute per square metre at a differential pressure of 2 psi (14 kPa). Flow rate shall not vary more than ±15% from the nominal rate specified, measured over any square foot (0.10 m^2) of the product and not more than ±30%, measured over any 1.5 in. (38 mm) diameter circle.

3.4.4.1 Flow rate requirements shall apply to the product before forming and fabrication into parts. If flow rates are determined on parts, consideration shall be given to the effects of forming, welding, brazing, and other operations which may alter the original flow characteristics.

3.4.5 Modulus of Elasticity: The product shall show a modulus of elasticity (E) not lower than specified in Table II, determined dynamically by a procedure agreed upon by purchaser and vendor.

TABLE II

Construction	Test Temperature	E psi x 10^6
2-39-480	1700°F ± 10	8.0
2-33-120	1700°F ± 10	10.5
5-74-120	77°F ± 10	13.0

TABLE II (SI)

Construction	Test Temperature	E MPa
2-99-1463	925°C ± 5	55,150
2-84-366	925°C ± 5	72,400
5-188-366	25°F ± 5	89,650

3.5 Quality:

The product, 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 product.

3.6 Tolerances:

Shall be as specified on the drawing or as agreed upon by purchaser and vendor.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of the product shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.5. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product 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 properties (3.4.1), bending (3.4.2), grain size (3.4.3), flow rate (3.4.4), quality (3.5), and tolerances (3.6) are classified as acceptance tests and shall be performed on each heat or lot as applicable.

4.2.2 Periodic Tests: Tests to determine conformance to requirements for modulus of elasticity (3.4.5) are classified as periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

4.2.3 Preproduction Tests: Tests to determine conformance to all technical requirements of this specification are classified as preproduction tests and shall be performed prior to or on the initial shipment of the product to a purchaser, when a change in material, processing, or both requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.3.1 For direct U.S. Military procurement, substantiating test data and, when requested, preproduction tests material shall be submitted to the cognizant agency as directed by the procuring activity, the contracting officer, or the request for procurement.

4.3 Sampling:

Shall be in accordance with AMS 2371 and 4.3.1.

4.3.1 Specimens for flow rate and modulus of elasticity shall be as agreed upon by purchaser and vendor.

4.4 Approval:

4.4.1 Sample material shall be approved by purchaser before material for production use is supplied, unless such approval be waived by purchaser. Results of tests on production material shall be essentially equivalent to those on the approved sample.