

AEROSPACE MATERIAL SPECIFICATION



MAM 4778D

Issued	JUL 1989
Revised	FEB 1995
Reaffirmed	SEP 2000
Cancelled	MAR 2003
Superseding MAM 4778C	

Nickel Alloy, Brazing Filler Metal
92Ni - 4.5Si - 3.1B
980 to 1040 °C Solidus-Liquidus Range

UNS N99630

CANCELLATION NOTICE

This specification has been declared "CANCELLED" by the Aerospace Materials Division, SAE, as of March, 2003. By this action, this document will remain listed in the Numerical Section of the Index of Aerospace Material Specifications.

AMS 4778 covers the same material.

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1. SCOPE:

1.1 Form:

This specification covers a nickel alloy in the form of wire, rod, strip, foil, and powder and a viscous mixture (paste) of the powder in a suitable binder and procured in metric units.

1.1.1 AMS 4778 is the inch/pound version of this MAM.

1.2 Application:

This filter metal has been used typically for joining corrosion and heat resistant steels and alloys requiring corrosion and oxidation resistant joints with good strength at elevated temperatures, but usage is not limited to such applications. Also may be used as a corrosion and oxidation resistant hard coating.

1.3 Safety - Hazardous Materials:

While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards which may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The applicable issue of referenced publications shall be the issue in effect on the date of the purchase order.

2.1 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM B 214	Sieve Analysis of Granular Metal Powders
ASTM D 638M	Tensile Properties of Plastics (Metric)
ASTM E 18	Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
ASTM E 354	Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys

2.2 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-STD-2073-1	DOD Material, Procedures for Development and Application of Packaging Requirements
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3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 354, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - Composition

Element	min	max
Carbon	--	0.06
Silicon	4.00	5.00
Phosphorus	--	0.02
Sulfur	--	0.02
Boron	2.75	3.50
Cobalt (3.1.1)	--	0.10
Titanium	--	0.05
Aluminum	--	0.05
Iron (3.1.2)	--	0.50
Zirconium	--	0.05
Selenium (3.1.1)	--	0.005 (50 ppm)
Nickel	remainder	

3.1.1 Determination not required for routine acceptance.

3.1.2 Iron to 1.50% by weight maximum is permissible in strip and foil products (tape form).

3.2 Condition:

The product shall be supplied in the following condition:

3.2.1 Wire and Strip: Powder bonded in a suitable plastic.

3.2.2 Rod: As cast, with fins and projections removed.

3.2.3 Foil and Powder: As fabricated.

3.2.4 Paste: Shall consist of 84 to 90% by weight powder in a suitable binder and, unless otherwise ordered, shall not contain flux.

3.3 Properties:

Filler metal shall conform to the following requirements: