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AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

AMS 5787A

Issued 7-1-56
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Superseding AMS 5787

ALLOY WELDING ELECTRODES, COVERED, CORROSION AND HEAT RESISTANT 63Ni-5.0Cr-24.5Mo-5.5Fe

UNS W80004

This specification has been declared "NONCURRENT" by the Aerospace Materials Division, SAE, as of April 8, 1986. It is recommended that this specification not be specified for new designs.

This cover sheet should be attached to the "A" revision of the subject specification.

This specification is under the jurisdiction of AMS Committee "F".

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Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 5787A
Superseding AMS 5787
Issued 7-1-56
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ALLOY WELDING ELECTRODES, COVERED, CORROSION AND HEAT RESISTANT
63Ni - 5.0Cr - 24.5Mo - 5.5Fe

1. SCOPE:

1.1 Form: This specification covers a corrosion and heat resistant nickel alloy in the form of covered welding electrodes.

1.2 Application: Primarily for shielded-metal-arc welding of parts fabricated from material of similar or dissimilar composition, particularly when the weld zone is required to have corrosion and heat resistance comparable to those of the parent metal.

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

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

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 Federal Standards:

Federal Test Method Standard No. 151 - Metals; Test Methods

2.3.2 Military Specifications:

MIL-W-10430 - Welding Rods and Electrodes, Preparation for Delivery of

2.4 AWS Publications: Available from American Welding Society, Inc., 2501 North West 7th Street, Miami, FL 33125.

AWS A5.11 - Nickel and Nickel-Alloy Covered Welding Electrodes

3. TECHNICAL REQUIREMENTS:

3.1 Composition: Weld metal deposited from electrodes shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E354, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other analytical methods approved by purchaser:

	min	max
Carbon	--	0.12
ø Manganese	--	1.00
Silicon	--	1.00
Phosphorus	--	0.04
Sulfur	--	0.03
Chromium	4.00 -	6.00
Molybdenum	23.00 -	26.00
Iron	4.00 -	7.00
Cobalt (3.1.1)	--	2.50
Vanadium	--	0.60
Nickel	remainder	

3.1.1 Determination not required for routine acceptance.

3.1.2 Weld Pads for Chemical Analysis: The referee procedure for making pads of weld metal and removing ø samples for chemical analysis shall be AWS A5.11.

3.2 Type: Coverings shall be suitable for the following usability characteristics:

Type Designation	AWS Designation	Weld Position	Current
A	-15	All	DC
B	-16	All	DC - AC

3.2.1 When DC is specified, reverse polarity (electrode positive) is required.

3.2.2 Type A electrodes shall be supplied, unless otherwise specified.

3.3 Properties: Electrodes shall conform to the following requirements:

3.3.1 Weldability: Electrodes shall demonstrate good weldability and shall flow smoothly and evenly when used under the conditions specified in 3.2.

3.3.2 Burn-Off: The covering shall be consumed uniformly all around and shall not burn back from the core wire under proper welding conditions. Heating of the electrode during welding shall not cause injurious blistering of the covering within the ranges of current values recommended by the manufacturer.

3.3.3 Grip Portion and Arc Ends: A portion of the electrode 0.75 - 1.25 in. (20 - 30 mm) long on end-grip rods and 1.5 - 2.0 in. (40 - 50 mm) long on center-grip rods shall be bare to permit good electrical contact with the electrode holder. The arc end of the electrodes shall be sufficiently bare to permit easy striking of the arc but the length of this bare section, measured from the end of the electrode to the point where the full cross-section of the covering begins, shall not exceed the diameter of the bare wire and in no case shall it exceed 1/8 in. (3 mm).

3.3.4 Cleaning: Slag produced during welding shall be readily removable with hand tools.

3.4 Quality:

3.4.1 Core Wire: Shall be uniform in quality and condition, cylindrical, clean, sound, and free from foreign materials and from imperfections detrimental to weld quality.

3.4.2 Covering: Shall be uniform in quality, tightly adherent, and free from abnormal scabs, blisters, pock-marks, bruises, and other surface defects and shall withstand normal handling without damage. It shall not be harmfully hygroscopic and shall not adversely affect weld quality.

3.5 Standard Sizes and Lengths: The sizes and lengths in Table I are standard.

TABLE I

Nominal Diameter of Core Wire Inch	Length Inches
1/16, 5/64	9 and 18
3/32	9, 12, and 18
1/8, 5/32, 3/16, 1/4	14

TABLE I (SI)

Nominal Diameter of Core Wire Millimetres	Length Millimetres
1.5, 2.0	225 and 450
2.5	225, 300, and 450
3.0, 4.0, 5.0, 6.5	350

3.5.1 End-grip electrodes shall be supplied in all lengths except 18 in. (450 mm) where center-grip electrodes are required, unless otherwise specified.

3.6 Tolerances: Shall be as follows, unless otherwise specified:

Ø 3.6.1 Electrodes shall not vary in length more than ±1/4 in. (±6.5 mm) from the length ordered.

3.6.2 Electrode core wire shall not vary in diameter more than ±0.002 in. (±0.05 mm) from the size ordered.

3.6.3 Overall diameter of the covered electrodes shall not vary more than 4% from that of the sample approved as in 4.4.1.

3.6.4 Covering shall be concentric with the core wire to the extent that the maximum core-plus-one-covering dimension shall not exceed the minimum core-plus-one-covering dimension by more than 5% of the minimum core-plus-one-covering dimension.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of electrodes 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
Ø purchaser as required by 4.5. Purchaser reserves the right to sample and to perform such confirmatory testing as he deems necessary to ensure that the electrodes conform 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), grip
Ø portion and arc ends (3.3.3), sizes (3.5), and tolerances (3.6) are classified as acceptance tests and shall be performed to represent each control number of electrodes.