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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 5808

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Submitted for recognition as an American National Standard

STEEL, CORROSION AND HEAT RESISTANT, WELDING WIRE
19Cr - 13Ni - 2.5Mo
High Ferrite Grade, Trace Element Controlled

1. SCOPE:

1.1 Form:

This specification covers a corrosion and heat resistant steel in the form of welding wire.

1.2 Application:

This wire has been used typically as bare wire filler metal for gas-metal-arc or gas-tungsten-arc welding of corrosion and heat resistant steels and alloys, but usage is not limited to such applications.

2. APPLICABLE DOCUMENTS:

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

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale PA 15096-0001.

AMS 2248 Chemical Check Analysis Limits, Wrought Corrosion and Heat Resistant Steels and Alloys, Maraging and Other Highly-Alloyed Steels, and Iron Alloys
AMS 2371 Quality Assurance Sampling and Testing, Corrosion and Heat Resistant Steels and Alloys, Wrought Products and Forging Stock
AMS 2813 Packaging and Marking of Packages of Welding Wire, Standard Method
AMS 2814 Packaging and Marking of Packages of Welding Wire, Premium Quality
AMS 2816 Identification, Welding Wire, Color Code System
ARP1876 Weldability Test for Weld Filler Metal Wire

2.2 ASTM Publications:

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

ASTM E 353 Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron Alloys

2.3 AWS Publications:

Available from American Welding Society, P.O. Box 351040, Miami, FL 33135-1040.

American Welding Society Handbook, Volume 4

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 353, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - Composition

Element	min	max
Carbon	--	0.030
Manganese	1.00	2.50
Silicon	0.30	0.65
Phosphorus	--	0.015
Sulfur	--	0.010
Chromium	18.00	20.00
Nickel	12.00	14.00
Molybdenum	2.00	3.00
Copper	--	0.50
Boron	--	0.003 (30 ppm)
Aluminum	--	0.10
Lead	--	0.0005 (5 ppm)
Bismuth	--	0.00003 (0.3 ppm)
Selenium	--	0.0003 (3 ppm)
Calcium	--	0.0010 (10 ppm)
Oxygen	--	0.0025 (25 ppm)
Nitrogen	--	0.0060 (60 ppm)
Hydrogen	--	0.0010 (10 ppm)

3.1.1 Check Analysis: Composition variations shall meet the requirements of AMS 2248 except that no variation over maximum is permitted for lead, bismuth, selenium, calcium, oxygen, nitrogen, and hydrogen.

3.2 Condition:

Cold worked, bright finished, in a temper and with a surface finish which will provide proper feeding of the wire in machine welding equipment.

3.2.1 Wire shall be furnished on disposable spools for machine welding or in cut lengths for manual welding, as ordered.

3.2.2 In process annealing, between cold working operations, shall be performed in a suitable protective atmosphere.

3.2.3 Drawing compounds, oxides, dirt, oil, and other foreign materials shall be removed by cleaning processes which will neither result in pitting nor cause gas absorption by the wire or deposition of substances harmful to welding operations.

3.3 Properties:

Wire shall conform to the following requirements:

3.3.1 Ferrite Number: Ferrite number of the wire shall not be less than 4.0, based on the calculated ferrite content from the DeLong diagram. (See American Welding Society Handbook, Volume 4, 7th Edition, Page 106.)

3.3.2 Weldability: Melted wire shall flow smoothly and evenly during welding and shall produce acceptable welds. ARP1876 may be used to resolve disputes.

3.3.3 Spooled Wire: Shall conform to 3.3.3.1 and 3.3.3.2.

3.3.3.1 Cast: Wire, wound on standard 12-inch (305-mm) diameter spools, shall have imparted to it a curvature such that a specimen sufficient in length to form one loop with a 1 inch (25 mm) overlap, when cut from the spool and laid on a flat surface, shall form a circle 15 to 50 inches (381 to 1270 mm) in diameter.

3.3.3.2 Helix: The specimen on which cast was determined, when laid on a flat surface and measured between adjacent turns, shall show a vertical separation not greater than 1 inch (25 mm).

3.4 Quality:

Wire, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from imperfections detrimental to welding operations, operation of welding equipment, or properties of the deposited weld metal.

3.5 Sizes and Tolerances:

Wire shall be supplied in the sizes and to the tolerances shown in 3.5.1 and 3.5.2.

3.5.1 Diameter:

TABLE 2A - Wire Sizes and Tolerance, Inch/Pound Units

Form	Nominal Diameter Inch	Tolerance Inch Plus	Tolerance Inch Minus
Cut Lengths	0.030, 0.035, 0.045, 0.062	0.002	0.002
Cut Lengths	0.094, 0.125	0.003	0.003
Spools	0.010, 0.020	0.0005	0.0005
Spools	0.030, 0.035, 0.045, 0.062	0.001	0.002

TABLE 2B - Wire Sizes and Tolerances, SI Units

Form	Nominal Diameter Millimeters	Tolerance Millimeter Plus	Tolerance Millimeter Minus
Cut Lengths	0.76, 0.89, 1.14, 1.57	0.05	0.05
Cut Lengths	2.39, 3.18	0.08	0.08
Spools	0.25, 0.51	0.013	0.013
Spools	0.76, 0.89, 1.14, 1.57	0.025	0.05

3.5.2 Length: Cut lengths shall be furnished in 18, 27, or 36 inch (457, 686, or 914 mm) lengths, as ordered, and shall not vary more than +0, -0.5 inch (-13 mm) from the length ordered.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of wire shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the wire conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests for composition (3.1), ferrite number (3.3.1), sizes and tolerances (3.5) and alloy verification (5.2.1) are acceptance tests and shall be performed on each heat or lot as applicable.