AMS 5829

ADOPTION NOTICE

AMS 5829 "Nickel Alloy, Corrosion and Heat Resistant, Welding Wire 56Ni – 19.5Cr – 16.5Co – 2.5Ti – 1.5Al Vacuum Induction Melted" was adopted on 22 August 1994 for use by the Department of Defense (DoD). Proposed changes by DoD activities must be submitted to the DoD Adopting Activity: Air Force, ASC/ENOSD, Building 125, 2335 Seventh Street, Suite 6, Wright–Patterson AFB OH 45433–7809. DoD activities may obtain copies of this standard from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111–5094. The private sector and other Government agencies may purchase copies from the Society of Automotive Engineers Inc., 400 Commonwealth Drive, Warrendale, PA 15096–0001.

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AEROSPACE MATERIAL SPECIFICATION

SAE AMS 5829C

Issued DEC 1973
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Superseding AMS 5829B

Submitted for recognition as an American National Standard

NICKEL ALLOY, CORROSION AND HEAT RESISTANT, WELDING WIRE
56Ni - 19.5Cr - 16.5Co - 2.5Ti - 1.5Al
Vacuum Induction Melted

UNS N07090

1. SCOPE:

1.1 Form:

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

1.2 Application:

This wire has been used typically as filler metal for gas-tungsten-arc or gas-metal-arc welding nickel alloys of similar composition requiring joints with strength and corrosion resistance comparable to those of the basis metal, 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 2269 Chemical Check Analysis Limits, Wrought Nickel Alloys and Cobalt 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, Tab Marking Method
AMS 2819 Identification, Welding Wire, Direct 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 354 Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys

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	--	0.13
Manganese	--	1.00
Silicon	--	1.00
Sulfur	--	0.015
Chromium	18.00	21.00
Cobalt	15.00	18.00
Titanium	2.00	3.00
Aluminum	1.00	2.00
Boron	--	0.02
Iron	--	1.50
Copper	--	0.20
Zirconium	--	0.15
Lead	--	0.002 (20 ppm)
Bismuth	--	0.0001 (1 ppm)
Silver	--	0.0005 (5 ppm)
Nickel	remainder	

3.1.1 Check Analysis: Composition variations shall meet the requirements of AMS 2269.

3.2 Melting Practice:

Alloy shall be produced by vacuum induction melting; it may be remelted using consumable electrode vacuum process but remelting is not required.

3.3 Condition:

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

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

3.3.2 In-process annealing between cold rolling or drawing operations shall be performed in a suitable protective atmosphere.

3.3.3 (R) 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.

3.4 Properties:

Wire shall conform to the following requirements:

3.4.1 (R) Weldability: Melted wire shall flow smoothly and evenly during welding and shall produce acceptable welds, ARP1876 may be used to resolve disputes.

3.4.2 Spooled Wire: Shall conform to 3.4.2.1 and 3.4.2.2.

3.4.2.1 (R) 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.

3.4.2.2 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).

3.5 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.

3.6 Sizes and Tolerances:

Wire shall be supplied in the sizes and to the tolerances shown in 3.6.1 and 3.6.2.

3.6.1 Diameter: Shall be as shown in Table 2.

TABLE 2A - Sizes and Diameter Tolerances, Inch/Pound Units

Form	Nominal Diameter Inch	Tolerance Inch Plus	Tolerance Inch Minus
Cut Lengths	0.030, 0.045, 0.062, 0.078	0.002	0.002
Cut Lengths	0.094, 0.125, 0.156, 0.188	0.003	0.003
Spools	0.007, 0.010, 0.015, 0.020	0.0005	0.0005
Spools	0.030, 0.035, 0.045	0.001	0.002
Spools	0.062, 0.078, 0.094	0.002	0.002

TABLE 2B - Sizes and Diameter Tolerances, SI Units

Form	Nominal Diameter Millimeters	Tolerance Millimeter Plus	Tolerance Millimeter Minus
Cut Lengths	0.76, 1.14, 1.57, 1.98	0.05	0.05
Cut Lengths	2.39, 3.18, 3.96, 4.78	0.08	0.08
Spools	0.18, 0.25, 0.38, 0.51	0.013	0.013
Spools	0.76, 0.89, 1.14	0.025	0.05
Spools	1.57, 1.98, 2.39	0.05	0.05

3.6.2 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:

(R)

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.