SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS 6465C

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Superseding AMS 6465B

(R)

Wire, Steel Welding
2.0Cr - 10Ni - 8.0Co - 1.0Mo - 0.02Al - 0.06V (0.10 - 0.14C)
Vacuum Melted, Environment Controlled Packaging

K91971

1. SCOPE:

1.1 Form:

This specification covers a low-alloy steel in the form of welding wire.

1.2 Application:

This wire has been used typically as filler metal for gas-tungsten-arc and gas-metal-arc welding of steels of similar composition which may be heat treated after welding, but usage is not limited to such applications.

2. APPLICABLE DOCUMENTS:

The issue of the following documents in effect on the date of the purchase order form a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been canceled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications:

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

AMS 2248	Chemical Check Analysis Limits, Corrosion and Heat Resistant Steels and Alloys, Maraging and Other Highly-Alloyed Steels, and Iron Alloys
AMS 2370	Quality Assurance Sampling and Testing, Carbon and Low-Alloy Steel Wrought Products and Forging Stock
AMS 2813	Packaging and Marking of Packages of Welding Wire, Standard Method
AMS 2814	Packages of Welding Wire, Premium Quality

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: custsvc@sae.org
SAE WEB ADDRESS: http://www.sae.org

2.1 (Continued):

AMS 2816	Identification, Welding Wire, Tab Marking Method
AMS 2819	Identification, Welding Wire, Direct Color Code System
AMS 6543	Steel Bars and Forgings, Maraging, 2.0Cr - 10Ni - 8.0Co - 1.0Mo (0.10 - 0.14C), Double Vacuum Melted, Solution Heat Treated
AMS 6544	Steel Plate, Maraging, 2.0Cr - 10Ni - 8.0Co - 1.0Mo (0.10 - 0.14C) Double Vacuum Melted, Solution Heat Treated
ARP1876	Weldability Test for Weld Filler Metal Wire
ARP4926	Alloy Verification and Chemical Composition Inspection of Welding Wire

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM D 2650	Chemical Composition of Gases by Mass Spectrometry
ASTM E 8	Tension Testing of Metallic Materials
ASTM E 8M	Tension Testing of Metallic Materials, Metric
ASTM E 23	Notched Bar Impact Testing of Metallic Materials
ASTM E 353	Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron 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 353, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - Composition

Element	min	max
Carbon (3.1.2)	0.10	0.14
Manganese	0.07	0.17
Silicon	0.15	0.25
Phosphorus	--	0.006
Sulfur	--	0.006
Chromium	1.80	2.20
Nickel	9.50	10.50
Cobalt	7.50	8.50
Molybdenum	0.90	1.10
Aluminum	0.01	0.03
Vanadium	0.04	0.09
Titanium	--	0.02
Oxygen (3.1.2)	--	0.0025 (25 ppm)
Nitrogen (3.1.2)	--	0.005 (50 ppm)
Hydrogen (3.1.2) (3.1.3)	--	0.0003 (3 ppm)

3.1.1 Check Analysis: Composition variations shall meet the applicable requirements of AMS 2248, except that no variation is permitted for oxygen, nitrogen, and hydrogen.

3.1.2 Shall be determined on finished wire.

3.1.3 The hydrogen content of the wire shall be determined at final diameter in accordance with ASTM D 2650.

3.1.4 Chemical analysis of initial ingot, bar, or rod stock before drawing, other than those analyses required to be done on the finished wire, is acceptable provided the processes used for drawing or rolling, annealing, and cleaning are controlled to ensure continued conformance to requirements.

3.2 Melting Practice:

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

3.3 Condition:

Cold worked, bright finish, and stress-relieved in a temper which will provide proper feeding of the wire in machine welding equipment.

3.4 Fabrication:

3.4.1 Wire shall be formed from rod or bar descaled by a process that does not affect the composition of the wire.

3.4.2 Butt welding is permissible provided both ends to be joined are either alloy verified using a method or methods capable of distinguishing the alloy from all others processed in the facility, or the repair is made at the wire processing station. The butt weld shall not interfere with uniform, uninterrupted feeding of the wire in machine welding equipment.

3.4.3 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.

3.4.4 Residual elements and dissolved gasses picked up during wire processing that can adversely affect the welding characteristics, the operation of the equipment, or the properties of weld metal shall be removed.

3.4.5 In-process annealing, if required between cold rolling or drawing operations, shall be performed in vacuum or protective atmosphere to avoid surface oxidation and absorbtion of other extraneous elements.