



AEROSPACE MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 5028

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STEEL WIRE, WELDING

1.05Cr - 0.55Ni - 1.0Mo - 0.07V (0.34 - 0.40C)

Vacuum Melted, Environment Controlled

1. **ACKNOWLEDGMENT:** A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.
2. **APPLICATION:** Primarily for gas tungsten-arc welding structural assemblies requiring heat treatment response to ultra high strength levels.
3. **COMPOSITION:**

	min	max
Carbon	0.34 - 0.40	
Manganese	0.60 - 0.90	
Silicon	0.15 - 0.30	
Phosphorus	-- 0.008	
Sulfur	-- 0.008	
Chromium	0.90 - 1.20	
Nickel	0.40 - 0.70	
Molybdenum	0.90 - 1.10	
Vanadium	0.05 - 0.10	
Copper	-- 0.35	
Hydrogen	-- 0.0010 (10 ppm)	
Oxygen	-- 0.0025 (25 ppm)	
Nitrogen	-- 0.0050 (50 ppm)	

- 3.1 **Check Analysis:** Composition variations shall meet the requirements of the latest issue of AMS 2259, paragraph titled "Low Alloy Steels."
4. **CONDITION:** Unless otherwise specified wire shall be formed from bar descaled by a process which does not affect the composition of the material. Surface irregularities inherent with a forming process which does not tear the wire surface are acceptable provided the wire conforms to the tolerances of Section 7 and the irregularities are free from contaminants. Wire shall be furnished on disposable spools for machine welding or in cut lengths for manual welding, as ordered.
 - 4.1 **Temper:** Shall be as agreed upon by purchaser and vendor.
 - 4.2 Drawing compounds, oxides, and dirt shall be removed from the surface of the wire.
5. **TECHNICAL REQUIREMENTS:**
 - 5.1 **Welding:** Melted wire shall flow smoothly and evenly during welding and shall be capable of producing acceptable welds by a method agreed upon by purchaser and vendor.
 - 5.2 **Spooled Wire:** Shall conform to the following unless otherwise agreed upon by purchaser and vendor.
 - 5.2.1 **Cast:** Wire shall have imparted to it a curvature such that a specimen sufficient in length to form one loop, when cut from the spool and laid on a flat surface, shall form a circle not less than 15 in. and not greater than 30 in. in diameter.

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5.2.2 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.

5.2.3 Layer Winding: Wire shall be closely wound in layers but adjacent turns within a layer need not necessarily be touching; shall be wound so as to avoid producing kinks, waves, and sharp bends; and shall be free to unwind without restriction caused by overlapping or wedging. The outside end of the spooled wire shall be so treated that it may be readily located.

5.3 Heat: Wire on each spool shall be of one continuous length from the same heat of material. Cut lengths in any one package shall be from the same heat of material.

6. QUALITY: Unless otherwise specified, material shall be multiple melted under vacuum using consumable electrode process. The product shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external imperfections detrimental to welding operations, operation of welding equipment, or properties of the deposited weld metal.

7. SIZES AND TOLERANCES: Unless otherwise specified, wire shall be supplied in the following sizes and to the tolerances shown:

7.1 Diameter:

Nominal Diameter Inch	Tolerance, Inch plus and minus
0.030, 0.045, 0.062, 0.093, 0.125	0.002

7.2 Lengths: Cut lengths shall be furnished in 18, 27, or 36 in. lengths, as ordered, and shall not vary more than +0, -1/2 in. from the length ordered.

8. REPORTS:

8.1 Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report of the results of tests for chemical composition of each heat in the shipment and a statement that the product conforms to the technical requirements of this specification. This report shall include the purchase order number, material specification number, heat number, nominal size, and quantity from each heat.

8.2 Unless otherwise specified when parts made of this wire or assemblies requiring the use of this welding wire are supplied, the part or assembly manufacturer shall inspect each lot of wire to determine conformance to this specification and shall furnish with each shipment three copies of a report stating that the wire conforms to the requirements of this specification. This report shall include the purchase order number, material specification number, part or assembly number, and quantity.

9. IDENTIFICATION: Unless otherwise specified, identification shall appear on unit containers in accordance with the applicable requirements of the latest issue of AMS 2815.

10. PACKAGING: Unless otherwise specified, wire shall be packaged in a hermetically sealed container immediately after final processing.

11. APPROVAL:

11.1 To assure adequate performance characteristics, wire samples shall be approved by purchaser, unless such approval be waived.

11.2 Test welds shall be made and tested in accordance with a procedure agreed upon by purchaser and vendor.