

MATERIAL SPECIFICATIONS

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc.

485 Lexington Ave., New York 17, N.Y.

Issued 1-15-61

Revised 1-15-63

STEEL WIRE, WELDING, CORROSION AND MODERATE HEAT RESISTANT
13Cr - 2Ni - 3W

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
2. APPLICATION: Primarily as filler metal for welding corrosion resistant steels of similar composition.
3. COMPOSITION:

Carbon	0.15 - 0.20
Manganese	0.50 max
Silicon	0.50 max
Phosphorus	0.040 max
Sulfur	0.030 max
Chromium	12.00 - 14.00
Nickel	1.80 - 2.20
Tungsten	2.50 - 3.50
Molybdenum	0.50 max
Aluminum	0.15 max
Copper	0.50 max
Tin	0.05 max

- 3.1 Check Analysis: Composition variations shall meet the requirements of the latest issue of AMS 2248.

4. CONDITION:

- 4.1 Unless otherwise specified, wire shall be cold drawn, annealed, and descaled. Wire shall be furnished on disposable spools for machine welding and in cut lengths for manual welding, as ordered.
- 4.2 Oxides, dirt, drawing compounds, and other surface contamination shall be removed by cleaning operations which will not cause gas absorption by the wire or deposition of substances harmful to welding operations.

5. TECHNICAL REQUIREMENTS:

- 5.1 Welding: Melted wire shall flow smoothly and evenly during welding and shall be capable of producing acceptable welds.
- 5.2 Hardenability: Weld metal deposits approximately 1/4 in. in thickness on AMS 5508 or AMS 5616 steel, heated to 1800 F $\pm$ 10 (982.2 C $\pm$ 5.6), held at heat for 15 - 30 min., and air cooled shall have hardness not lower than Rockwell C 42 or equivalent.
- 5.3 Spooled Wire: Shall conform to the following unless otherwise agreed upon by purchaser and vendor.

- 5.3.1 Cast: Wire shall have imparted to it a curvature such that a specimen 6 - 8 ft in length, when cut from the spool and suspended freely from its approximate midlength, shall form a circle not less than 20 in. and not greater than 36 in. in diameter (See Fig. 1). If the curvature of the wire results in a coil of more than 1-1/2 turns, the excess shall be clipped off and the wire resuspended from its new approximate midlength.
- 5.3.2 Helix: A specimen cut and suspended as in 5.3.1 and measured between adjacent turns shall show a separation not greater than 4 in. (See Fig. 1).
- 5.3.3 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.
- 5.4 Heat: Wire on each spool shall be 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: Wire shall be uniform in quality and condition, clean, sound, smooth, 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:

Form	Nominal Diameter Inch	Tolerance, Inch plus and minus
Cut Lengths	0.045, 0.062, 0.093, 0.125	0.003
Spools	0.030, 0.035, 0.045, 0.062, 0.093	0.001
Spools	0.007, 0.010, 0.015, 0.020	0.0005

- 7.2 Length: Cut lengths shall be furnished in 18, 27, or 36 in. lengths, as ordered, and shall not vary more than $\pm 1/4$ 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, heat number, material specification 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.