

Submitted for recognition as an American National Standard

STEEL WIRE, FLAT, CORROSION RESISTANT
18Cr - 9.0Ni (SAE 30302)
Spring Temper

UNS S30200

1. SCOPE:

- 1.1 Form: This specification covers a corrosion-resistant steel in the form of flat wire.
- 1.2 Application: Primarily for retaining rings requiring corrosion and heat resistance up to 400°F (204°C) and which require moderate to severe forming and bending.

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 documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

- AMS 2248 - Chemical Check Analysis Limits, Wrought Corrosion and Heat Resistant Steels and Alloys, Maraging and other Highly-Alloyed Steels, and Iron Alloys
- AMS 2350 - Standards and Test Methods
- AMS 2371 - Quality Assurance Sampling of Corrosion and Heat Resistant Steels and Alloys, Wrought Products Except Forgings and Forging Stock

SAE Technical Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any particular infringement arising therefrom, is the sole responsibility of the user."

AMS documents are protected under United States and international copyright laws. Reproduction of these documents by any means is strictly prohibited without the written consent of the publisher.

2.2 ASTM Publications: Available from ASTM, 1916 Race Street, Philadelphia, PA 19103.

ASTM A370 - Mechanical Testing of Steel Products

ASTM E353 - Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron Alloys

2.3 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Military Standards:

MIL-STD-163 - Steel Mill Products, Preparation for Shipment and Storage

3. TECHNICAL REQUIREMENTS:

3.1 Composition: Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E353, by spectrochemical methods, or by other analytical methods acceptable to purchaser:

	min	max
Carbon	--	0.15
Manganese	--	2.00
Silicon	--	1.00
Phosphorus	--	0.040
Sulfur	--	0.030
Chromium	17.00 - 19.00	
Nickel	8.00 - 10.00	
Molybdenum	--	0.75
Copper	--	0.75

3.1.1 Check Analysis: Composition variations shall meet the requirements of AMS 2248.

3.2 Condition: Spring temper; cold drawn or rolled, descaled, and rerolled to required size.

3.3 Properties: Wire shall conform to the following requirements, determined in accordance with ASTM A370:

- 3.3.1 Tensile Strength: Square wire, and rectangular wire having nominal width not greater than ten times the nominal thickness, shall have tensile strength as shown in Table I.

TABLE I

Nominal Thickness Inch	Tensile Strength psi	Elongation in 4D %, minimum
0.008 to 0.022, incl	210,000 - 250,000	-
Over 0.022 to 0.047, incl	200,000 - 240,000	3
Over 0.047 to 0.062, incl	185,000 - 235,000	3
Over 0.062 to 0.074, incl	175,000 - 225,000	3
Over 0.074 to 0.089, incl	165,000 - 215,000	3
Over 0.089 to 0.095, incl	155,000 - 205,000	3

TABLE I (SI)

Nominal Thickness Millimetres	Tensile Strength MPa	Elongation in 4D %, minimum
0.20 to 0.56, incl	1448 - 1724	-
Over 0.56 to 1.19, incl	1379 - 1655	3
Over 1.19 to 1.57, incl	1276 - 1620	3
Over 1.57 to 1.88, incl	1207 - 1551	3
Over 1.88 to 2.26, incl	1138 - 1482	3
Over 2.26 to 2.41, incl	1069 - 1413	3

- 3.3.2 Hardness: Shall be as follows:

Nominal Thickness		Hardness
Inch	Millimetres	
0.008 to 0.015, incl	0.20 to 0.38, incl	83.0 - 86.0 HR15N
Over 0.015 to 0.022, incl	Over 0.38 to 0.56, incl	64.0 - 69.5 HR30N
Over 0.022 to 0.047, incl	Over 0.56 to 1.19, incl	72.0 - 74.9 HRA
Over 0.047 to 0.062, incl	Over 1.19 to 1.57, incl	39.8 - 48.5 HRC
Over 0.062 to 0.074, incl	Over 1.57 to 1.88, incl	38.0 - 47.0 HRC
Over 0.074 to 0.089, incl	Over 1.88 to 2.26, incl	36.5 - 45.0 HRC
Over 0.089 to 0.095, incl	Over 2.26 to 2.41, incl	34.5 - 44.0 HRC

3.4 Quality:

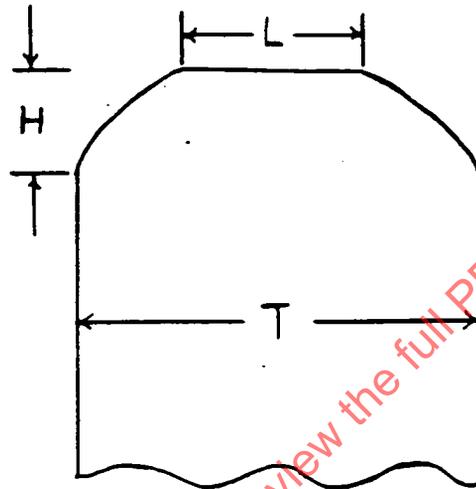
- 3.4.1 Wire, as received by purchaser, shall be uniform in quality and condition, sound, and free from kinks, twists, scrapes, splits, cold shuts, pipe, seams, blisters, laminations, inclusions, and other imperfections detrimental to usage of the wire.
- 3.4.2 Wire shall have a bright, smooth, cold drawn or rolled surface free from pits, abrasions, and other surface imperfections. Wire for coiling on automatic spring winding machines shall be furnished with a lubricating coating suitable for such purpose.

3.4.3 All welds made on coiled or spooled wire shall be marked and the method of marking shall be specified on the spool, label, or tag. Straightened or flattened cut lengths shall have no welds.

3.5 Tolerances:

3.5.1 Edges: Wire shall have commercial round edges as shown in Figure 1 and the maximum camber shall be 1/2 inch in 8 feet (12.7 mm in 2.4 m).

FIGURE 1



3.5.1.1 For wire thickness "T" 0.021 inch (0.53 mm) and under, the crown dimension "H" shall be 0.005 inch (0.13 mm) minimum and the maximum dimension of "L" shall be 0.010 inch (0.25 mm) less than thickness "T".

3.5.1.2 For wire thickness "T" over 0.021 inch (0.53 mm), the crown dimension "H" shall be 0.010 inch (0.25 mm) minimum and the maximum dimension of "L" shall be 0.020 inch (0.51 mm) less than thickness "T".

3.5.2 Thickness: Shall be as shown in Table II

TABLE II

Thickness Inch	Tolerance, Inch plus and minus
Up to 0.010, incl	0.00035
Over 0.010 to 0.021, incl	0.0005
Over 0.021 to 0.045, incl	0.00075
Over 0.045 to 0.060, incl	0.0010
Over 0.060 to 0.089, incl	0.0015
Over 0.089	0.0020

TABLE II (SI)

Thickness Millimetres	Tolerance, Millimetre plus and minus
Up to 0.25, incl	0.0089
Over 0.25 to 0.53, incl	0.013
Over 0.53 to 1.14, incl	0.0190
Over 1.14 to 1.52, incl	0.025
Over 1.52 to 2.26, incl	0.038
Over 2.26	0.051

3.5.3 Width: Shall be as shown in Table III.

TABLE III

Width Inches	Tolerance, Inch plus minus		Variation in 15 Continuous Feet
Up to 0.045, incl	0.002	0.002	0.001
Over 0.045 to 0.079, incl	0.003	0.002	0.001
Over 0.079 to 0.119, incl	0.004	0.003	0.001
Over 0.119 to 0.159, incl	0.005	0.003	0.001
Over 0.159 to 0.299, incl	0.005	0.004	0.0015
Over 0.299 to 0.499, incl	0.006	0.004	0.002
Over 0.499	0.007	0.005	0.002

TABLE III (SI)

Width Millimetres	Tolerance, Millimetre plus minus		Variation in 4.6 Continuous Metres
Up to 1.14, incl	0.05	0.05	0.025
Over 1.14 to 2.01, incl	0.08	0.05	0.025
Over 2.01 to 3.02, incl	0.10	0.08	0.025
Over 3.02 to 4.04, incl	0.13	0.08	0.025
Over 4.04 to 7.59, incl	0.13	0.10	0.038
Over 7.59 to 12.67, incl	0.15	0.10	0.051
Over 12.67	0.18	0.13	0.051

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. Results of such tests shall be reported to the purchaser as required by 4.4. 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.