



Designation: A603 – 19

Standard Specification for Metallic-Coated Steel Structural Wire Rope¹

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1. Scope*

1.1 This specification covers metallic-coated steel structural wire rope, prestretched or nonprestretched for use where a high-strength, relatively flexible prefabricated metallic-coated multiple-wire tension member is desired as a component part of a structure.

1.2 The wire rope is furnished with Class A weight zinc or zinc-aluminum alloy-coated wires throughout. It can be furnished with Class B weight or Class C weight zinc-coated outer wires or Class B weight or Class C weight zinc-coated wires throughout as an option.

1.3 *Units*—The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

A90/A90M Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings
A902 Terminology Relating to Metallic Coated Steel Products

B6 Specification for Zinc

B750 Specification for GALFAN

B997 Specification for Zinc-Aluminum Alloys in Ingot Form for Hot-Dip Coatings

¹ This specification is under the jurisdiction of ASTM Committee A05 on Metallic-Coated Iron and Steel Products and is the direct responsibility of Subcommittee A05.12 on Wire Specifications.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

3. Terminology

3.1 *Definitions*—For definitions of terms used in this specification, see Terminology A902.

4. Ordering Information

4.1 Orders for material under this specification shall include the following information:

4.1.1 Length of wire rope,

4.1.2 Nominal diameter of wire rope (Tables 1-4),

4.1.3 Prestretched (see 8.3) or nonprestretched,

4.1.4 Coating-weight class if other than Class A (Table 5),

4.1.5 Coating type: zinc (Z) or zinc-aluminum alloy (ZA) for Class A only,

4.1.6 Mechanical tests if required (see 10.1),

4.1.7 Special packaging requirements (Section 13), and

4.1.8 Inspection (Section 12).

5. Materials and Manufacture

5.1 *Base Metal*—The base metal shall be carbon steel made by the open-hearth, basic-oxygen, or electric-furnace process and of such quality that the finished wire rope and the hard-drawn individual metallic-coated wires coated by the hot-dip or electrolytic process shall have the properties and characteristics as prescribed in this specification.

5.2 *Zinc*—The slab zinc when used shall conform to Specification B6 or better.

5.3 *Zinc-Aluminum Alloy*—The slab of zinc-aluminum alloy when used shall conform to Specifications B750 or B997 at the discretion of the manufacturer.

6. Physical Properties

6.1 Tensile Properties:

6.1.1 The metallic-coated wire used in the wire rope shall conform to the mechanical properties in Table 6 prior to fabrication, but the wire test sample may be prestretched to 55 % of the minimum tensile strength specified in Table 6 prior to conducting the tests.

6.1.2 The tensile strength and the stress at 0.7 % extension shall be based on the actual cross-sectional area of the finished wire, including the metallic coating.

6.1.3 *Test Specimens*—The test specimens shall be free of bends or kinks other than the curvature resulting from the usual coiling operation. The hand straightening necessary to permit

*A Summary of Changes section appears at the end of this standard





TABLE 1 Properties of Single-Class Metallic-Coated Steel Structural Wire Rope (Inch-Pound Units)

Nominal Diameter, in.	Minimum Breaking Strength in Tons of 2000 lb			Approximate Gross Metallic Area, in. ²	Approximate Weight/ft, lb
	Class A Coating Throughout	Class B Coating Throughout	Class C Coating Throughout		
3/8	6.5	6.2	5.9	0.065	0.24
7/16	8.8	8.4	8.0	0.091	0.32
1/2	11.5	11.0	10.5	0.119	0.42
9/16	14.5	13.8	13.2	0.147	0.53
5/8	18.0	17.2	16.4	0.182	0.65
11/16	21.5	20.5	19.5	0.221	0.79
3/4	26.0	24.8	23.6	0.268	0.95
13/16	30.0	28.6	27.3	0.311	1.10
7/8	35.0	33.4	31.8	0.361	1.28
15/16	40.0	38.2	36.4	0.414	1.47
1	45.7	43.6	41.5	0.471	1.67
1 1/8	57.8	55.1	52.5	0.596	2.11
1 1/4	72.2	68.9	65.6	0.745	2.64
1 3/8	87.8	83.8	79.8	0.906	3.21
1 1/2	104.0	99.2	94.5	1.076	3.82
1 5/8	123.0	117.0	112.0	1.270	4.51
1 3/4	143.0	136.0	130.0	1.470	5.24
1 7/8	164.0	156.0	149.0	1.690	6.03
2	186.0	177.0	169.0	1.920	6.85
2 1/8	210.0	200.0	191.0	2.170	7.73
2 1/4	235.0	224.0	214.0	2.420	8.66
2 3/8	261.0	249.0	237.0	2.690	9.61
2 1/2	288.0	275.0	262.0	2.970	10.60
2 5/8	317.0	302.0	288.0	3.270	11.62
2 3/4	347.0	331.0	315.0	3.580	12.74
2 7/8	379.0	362.0	344.0	3.910	13.90
3	412.0	393.0	374.0	4.250	15.11
3 1/4	475.0	453.0	432.0	5.040	18.00
3 1/2	555.0	529.0	504.0	5.830	21.00
3 3/4	640.0	611.0	582.0	6.670	24.00
4	730.0	696.0	664.0	7.590	27.00

TABLE 2 Properties of Single-Class Metallic-Coated Steel Structural Wire Rope (SI Units)

Nominal Diameter, mm	Minimum Breaking Strength in Metric Tons			Approximate Gross Metallic Area, mm ²	Approximate Weight/m, kg
	Class A Coating Throughout	Class B Coating Throughout	Class C Coating Throughout		
9.53	5.9	5.6	5.4	41.9	0.36
11.11	8.0	7.6	7.3	58.7	0.48
12.70	10.4	10.0	9.5	76.8	0.62
14.29	13.2	12.5	12.0	94.8	0.79
15.88	16.3	15.6	14.9	117.4	0.97
17.46	19.5	18.6	17.7	142.6	1.18
19.05	23.6	22.5	21.4	172.9	1.41
20.64	27.2	25.9	24.8	200.7	1.64
22.23	31.8	30.3	28.8	232.9	1.90
23.81	36.3	34.7	33.0	267.1	2.19
25.40	41.5	39.6	37.6	303.9	2.48
28.58	52.4	50.0	47.6	384.5	3.14
31.75	65.5	62.5	59.5	480.7	3.93
34.93	79.7	76.0	72.4	584.6	4.78
38.10	94.3	90.0	85.7	694.2	5.68
41.28	112.0	106.0	101.0	819.4	6.71
44.45	130.0	124.0	118.0	948.4	7.80
47.63	149.0	142.0	135.0	1090.4	8.97
50.80	169.0	161.0	153.0	1238.8	10.19
53.98	190.0	182.0	173.0	1400.1	11.50
57.15	213.0	203.0	194.0	1561.4	12.89
60.33	237.0	226.0	215.0	1735.6	14.30
63.50	261.0	249.0	238.0	1916.2	15.77
66.68	288.0	274.0	261.0	2109.8	17.29
69.85	315.0	300.0	286.0	2309.8	18.96
73.03	344.0	328.0	312.0	2522.7	20.68
76.20	374.0	356.0	340.0	2742.1	22.48
82.55	431.0	411.0	392.0	3251.8	26.78
88.90	504.0	480.0	458.0	3761.5	31.25
95.25	581.0	554.0	528.0	4303.5	35.71
101.60	662.0	632.0	602.0	4897.1	40.18