

MIL-W-3314A  
29 March 1965

**SUPERSEDING**  
MIL-W-3314  
16 October 1950

## MILITARY SPECIFICATION

### WIRES, IRON OR STEEL, GALVANIZED

This specification has been approved by the Department of Defense and is mandatory for use by all Departments and Agencies of the Department of Defense.

#### 1. SCOPE

1.1 Scope. This specification covers three types of galvanized iron or steel wires used for open wire lines for communication.

1.2 Classification. Wire shall be of the following types, as specified (see 6.2).

- Type I - Soft annealed iron wire.
- Type II - High breaking strength steel wire.
- Type III - Extra high breaking strength steel wire.

#### 2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on date of invitation for bids form a part of this specification to the extent specified herein.

##### STANDARDS

###### FEDERAL

No. 151                      Metals, Test Methods.

###### MILITARY

MIL-STD-105                  Sampling Procedures and Tables for Inspection  
by Attributes.

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

(Copies of specifications and standards required by contractors in connection with specific procurement functions should be obtained from the procuring agency or as directed by the contracting officer.)

| FSC 6145 |

MIL-W-3314A

### 3. REQUIREMENTS

#### 3.1 Materials.

3.1.1 Iron Wire. The base metal of the iron wire shall be of such quality and purity that when drawn, uniformly annealed and galvanized, the finished wire shall have the properties covered by this specification.

3.1.2 Steel wire. The base metal of the steel wire shall be of such quality that when drawn and galvanized the finished wire shall have the qualities covered by this specification.

3.2 Sizes. Wire shall be of the size specified in table I. (See 6.2.)

3.3 Physical requirements. The wires shall have such mechanical properties as to meet the requirements specified in table I.

Table I. Physical requirements.

Type of Wire	Wire designation	Nominal diameter (size)	Nominal weight-plus and minus 10%	Minimum breaking strength	Minimum elongation - 10 inch gage length	Approximate length of coil	Nominal weight of wire in each coil
		<u>Inches</u>	<u>Pounds/mile</u>	<u>Pounds</u>	<u>Percent</u>	<u>Feet</u>	<u>Pounds</u>
I	----	0.238	798	2028	10	1320	200
	----	0.203	580	1475	10	1760	193
	----	0.165	383	975	10	2640	191
	W-75	0.148	309	785	10	2640	154
	----	0.134	253	645	10	2640	126
	----	0.109	167	425	10	2640	83
	W-76	0.083	97	247	10	2640	48
II	W-144	0.083	97	754	2	8030	148
III	----	0.109	167	1800	2	4660	145

3.4 Diameter tolerances. The permissible variations in diameter of the galvanized wires from the nominal diameter shall be plus and minus 0.004 inch for wires of 0.109 inch diameter or over, and plus and minus 0.003 inch for wires under 0.109 inch diameter.

3.5 Ductility. The wires shall exhibit no fractures when tested in accordance with 4.8.

3.6 Joints. The wires shall be drawn from solid rods containing no joints. Welds made prior to the final wire drawing will be permitted and shall be kept to a minimum. There shall be no joints of any kind made in the finished wire.

MIL-W-3314A

3.7 Zinc coating. The wires shall be covered with a smooth, continuous, adherent and uniform coating of commercially pure zinc (galvanized).

3.7.1 Weight of zinc coating. The weight of zinc coating on wires 0.109 inch in diameter and larger shall be not less than 0.80 ounce per square foot of uncoated wires surface, and on wires 0.083 inch in diameter shall be not less than 0.70 ounce per square foot of uncoated wires.

3.8 Adherence of zinc coating. When tested in accordance with 4.10, the zinc coating shall adhere to the wires without flaking and without being removable by rubbing with the fingers.

3.9 Resistivity. After drawing and galvanizing the wires, the resistivity of the wires, Types I, II, and III, expressed in ohm-pound/mile<sup>2</sup> at 20°C (68°F) shall conform to the following requirements:

Type I - Shall not exceed 5000 in any individual sample and the average resistivity of all samples shall not exceed 4900.

Type II - Shall not exceed 6500 in any individual sample and the average resistivity of all samples shall not exceed 6350.

Type III - Shall not exceed 7900 in any individual sample and the average resistivity of all samples shall not exceed 7750.

3.10 Workmanship. The wires shall be manufactured and finished in a workmanlike manner in accordance with the best commercial practice. All wires shall be cylindrical in form, shall have a smooth surface and shall be free from all die marks, scales, splints, flaws, kinks, or other imperfections. Iron wire shall be soft and pliable.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements.

4.2 Classification of inspection. Inspection shall be classified as follows:

- a. Acceptance inspection of wires before preparation for delivery (see 4.3).
- b. Acceptance inspection of preparation for delivery (see 4.4).

MIL-W-3314A

4.3 Acceptance inspection before preparation for delivery. Acceptance inspection before preparation for delivery shall consist of Inspection Groups A, B, and C.

4.3.1 Inspection lots. An inspection lot shall consist of all units of product of one type, produced under essentially the same conditions, and submitted for acceptance at the same time.

4.3.1.1 Unit of product. A unit of product is the continuous length of wire contained on a single reel, or spool, or in a package.

4.3.2 Group A inspection. Group A inspection shall consist of the examinations and tests specified in Table II. Statistical sampling and inspection shall be in accordance with Standard MIL-STD-105. The AQL shall be as specified in Table II. Major and minor defects shall be as defined in Standard MIL-STD-105.

Table II. Group A inspection.

Inspection	Requirement paragraph	Inspection paragraph	AQL	
			Major	Minor
Visual and Dimensional <sup>1</sup>	3.1, 3.2, 3.3, 3.4	4.5, 4.7	1.0% combined	4.0%
Breaking strength and elongation	3.3	4.6		---
Resistivity	3.9	4.11	1.0%	---

<sup>1</sup>Defects in wire diameter are major only.

4.3.3 Group B inspection. Group B inspection shall consist of the tests specified in Table III.

4.3.3.1 Sampling procedure. The sampling procedure shall be in accordance with Standard MIL-STD-105. Unless otherwise specified herein, normal inspection shall be used at the start of the contract. The AQL shall be 4% defective and the inspection level shall be S-4 for normal, tightened and reduced inspection.

Table III. Group B inspection.

Inspection	Requirement paragraph	Inspection paragraph
Ductility	3.5	4.8
Adherence of zinc coating	3.8	4.10

MIL-W-5314A

4.3.4 Group C inspection. Group C inspection shall consist of the test specified in paragraph 4.9 to determine compliance with the requirement of paragraph 3.7.

4.3.4.1 Sampling procedure. Units of product (see 4.3.1.1) shall be selected from the first production lot and from each month's production thereafter, in accordance with Table IV, and one specimen shall be cut from each unit for the Group C test.

Table IV. Group C sampling procedure.

Monthly Production	Sample Size	Acceptance Number
Under 66	2	0
66 to 180, incl.	3	0
181 to 500, incl.	5	1
501 to 800, incl.	7	1
801 to 1300, incl.	10	2
1301 and over	15	3

4.4 Acceptance inspection of preparation for delivery. Acceptance inspection of preparation for delivery shall consist of the examinations specified in paragraphs 4.4.1 and 4.4.2.

4.4.1 Preservation and packaging. Preservation and packaging shall be inspected in accordance with Standard MIL-STD-163. Classification of defects shall be as shown in table V.

Table V. Classification of defects for preservation, packaging, and marking.

Major	Minor
1. Use of improper or defective material.	1. Any item of marking information other than 3 through 6 omitted, incorrect, or illegible.
2. Incorrect packaging method applied.	
3. Stock number omitted, incorrect, or illegible.	
4. Nomenclature omitted, incorrect, or illegible.	
5. Marking of quantity of items in package omitted, incorrect, or illegible.	
6. Different stock numbered items in the same unit package.	

MIL-W-3314A

4.4.2 Packing and marking of exterior containers. Packing and marking of exterior containers shall be given visual inspection in accordance with table VI to determine compliance with Section 5. This inspection shall conform to the procedures for small sample inspection of Standard MIL-STD-105, using the special inspection level S-4. (Other statistical sampling procedures may be employed if approved by the contracting officer.)

- (a) Major defects - For sample sizes up to 13 inclusive, as determined by reference to Standard MIL-STD-105, each sample size as given shall be used and for these sample sizes, the acceptance number shall be zero. For sample sizes greater than 13, the acceptance number shall be determined by the AQL of 4.0 percent defective.
- (b) Minor defects - For sample sizes up to 5 inclusive, as determined by reference to Standard MIL-STD-105, each sample size as given shall be used and for these sample sizes, the acceptance number shall be zero. For sample sizes greater than 5, the acceptance number shall be determined by the AQL of 10 percent defective.

Table VI. Classification of defects for packing and marking.

Major	Minor
1. Use of improper or defective material.	1. Any item of required marking information other than 3 through 9 listed under major defects omitted, incorrect, or illegible.
2. Shipping documents or packing list omitted.	
3. Stock number omitted, incorrect, or illegible.	
4. Nomenclature omitted, incorrect, or illegible.	
5. Marking of quantity in pack omitted.	
6. Destruction marking omitted, incorrect, or illegible.	
7. Service designation (color marking) omitted.	
8. Specified special marking and labeling, shipment digit markings omitted, incorrect, or illegible.	
9. Over-seas code marking omitted, incorrect, or illegible.	

MIL-W-3314A

4.4.2.1 Inspection lot. A lot for visual inspection of the pack shall be all completed packs which are identical and will be submitted for acceptance at one time.

4.4.2.2 Procedure in case of failure. When an inspection lot fails, the contractor shall immediately investigate the cause of failure and take corrective action to assure that subsequent lots do not contain the same defect or defects.

4.5 Visual and dimensional inspection. The wires shall be examined for workmanship, size, and physical properties specified in table I, welds and joints specified in 3.6, and other miscellaneous defects. Visual and dimensional defects shall be classified by the Government as major or minor in accordance with the definitions of MIL-STD-105.

4.6 Breaking strength and elongation. The wires shall be tested in accordance with Method 211 of Federal Standard No. 151, to determine compliance with 3.3. The percent elongation shall be measured as the percent increase in length after rupture, between gage marks placed on the sample 10 inches apart before testing.

4.7 Diameter tolerances. The wires shall be measured to determine compliance with 3.4.

4.8 Ductility. The wires shall be wrapped for at least two close turns around its own diameter at a rate between 12 and 15 turns per minute to determine compliance with 3.5.

4.9 Weight of zinc coating. The wires shall be tested by the hydrochloric acid, antimony chloride method specified in Method 512 of Federal Standard No. 151 to determine compliance with 3.7.1.

4.10 Adherence of zinc coating. The wires shall be tested to determine compliance with 3.8, after the wire has been wrapped for at least two close turns around the cylindrical mandrel of the diameter specified in 4.10.1 and 4.10.2 at a rate of between 12 and 15 turns per minute.

4.10.1 Type I wires shall be bent around a mandrel with a diameter equal to that of the wires being tested.

4.10.2 Type II and type III wires shall be bent around a mandrel with a diameter of twice that of the wires being tested.

4.11 Resistivity. The wires shall be tested in accordance with Method 611 of Federal Standard No. 151 to determine compliance with 3.9.

## 5. PREPARATION FOR DELIVERY

5.1 Preservation, packaging and packing. Galvanized iron or steel wire shall be prepared for shipment in accordance with levels A or C; as specified. (See 6.2.)

MIL-W-3314A

5.1.1 Level A. Preservation, packaging and packing shall be in accordance with MIL-STD-163 as specified for galvanized wire covered under the detailed requirements for Wire, High Carbon.

5.2 Level C. Preservation, packaging and packing shall be in accordance with commercial practice and shall conform to the rules and regulations applicable to the mode of transportation employed.

5.3 Marking. In addition to any special marking specified in the contract or order, marking for shipment shall be in accordance with MIL-STD-163.

5.3.1 In addition to the marking requirements specified in 5.3, on shipment to ports, tags or labels shall bear an orange stripe running along the four edges of the tag or label. The width of the orange stripe shall be proportionate to the size of the tag or label.

## 6. NOTES

6.1 Intended use. The wires covered by this specification are intended for use as open wire lines for communication.

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number and date of this specification and any amendment thereto.
- b. Types required (see 1.2).
- c. Size of wire required (see 3.2).
- d. Level of packaging and level of packing requirement for shipment (Level A, level B, or level C).
- e. Length of wire to be wound into a coil (see table I).
- f. The specific paragraphs of section 5 which are applicable.
- g. Place of final inspection.

### Custodians:

Army - EL  
Navy - YD  
Air Force - 69

### Preparing Activity:

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Project No. 9505-0039

### Review:

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