J-C-96A
March 8, 1971
SUPERSEDING
Fed. Spec. J-C-96
May 16, 1961

FEDERAL SPECIFICATION

CABLE, TELEPHONE (W-108-B)

This specification was approved by the Commissioner, Federal Supply Services, General Services Administration, for the use of all Federal Agencies.

1. SCOPE

1.1 This specification covers telephone drop wire designated as W-108-B. This drop wire, hereinafter referred to as cable, consists of 2 parallel No. 18 AWG conductors, styrene butadiene rubber insulated, with a chloroprene rubber jacket. (See 6.1.)

2. APPLICABLE DOCUMENTS

2.1 The following documents, of the issues in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

Federal Specifications:

QQ-W-345 - Wire, Electrical, Steel, Copper-Covered.
PPP-B-585 - Boxes, Wood, Wirebound.
PPP-B-636 - Box, Fiberboard.

Federal Standards:

Fed. Std. No. 123 - Marking for Domestic Shipment (Civil Agencies).
Fed. Test Method Std. No. 228 - Cable and Wire, Insulated; Methods of Testing.

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, US Government Printing Office, Washington, DC 20402.

(Single copies of this specification and other Federal specifications required by activities outside the Federal Government for bidding purposes are available without charge from Business Service Centers at the General Services Administration Regional Offices in Boston, New York, Washington, DC, Atlanta, Chicago, Kansas City, MO, Fort Worth, Denver, San Francisco, Los Angeles, and Seattle, WA.

(Federal Government activities may obtain copies of Federal Specifications, Standards and Handbooks and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

Military Specifications:

MIL-I-3930	- Insulating and Jacketing Compounds, Electrical (For Cables, Cords and Wires).
MIL-C-45662	- Calibration System Requirements.

Military Standards:

MIL-STD-105	- Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-129	- Marking for Shipment and Storage.

(Copies of Military Specifications and Standards required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification, to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

American Society for Testing and Materials (ASTM) Publications:

ASTM B 189-63	Lead-Coated and Lead-Alloy-Coated Soft Copper Wire for Electrical Purposes.
ASTM D 1149-64	Accelerated Ozone Cracking of Vulcanized Rubber.

(Copies may be obtained from the American Society for Testing and Materials; 1916 Race Street, Philadelphia, Pa., 19103.)

National Motor Freight Traffic Association, Inc., Agent:

National Motor Freight Classification

(Application for copies should be addressed to the National Motor Freight Traffic Association, Inc., Agent, 1616 P Street N.W., Washington, D. C. 20036)

Uniform Classification Committee, Agent:

Uniform Freight Classification

(Application for copies should be addressed to the Uniform Classification Committee, Tariff Publishing Officer, Room 202 Union Station, 516 W. Jackson Blvd., Chicago, Illinois 60606)

3. REQUIREMENTS

3.1 Design and construction (see 4.5.1).

3.1.1 Conductor. Each conductor of cable W-108-B shall be No. 18 AWG solid copper-covered steel wire, and coated as specified in 3.1.1.1. The copper-covered steel wire shall be in accordance with QQ-W-345, type II. (See 4.3)

3.1.1.1 Conductor coating. Copper clad steel conductors shall be continuously coated with a lead or lead alloy coating in accordance with ASTM B 189-63. Lead or lead alloy coated conductors shall be coated with an electroplated flash coating of brass of sufficient weight to impart a characteristic brass color to the conductors, for purposes of bonding the insulation to the conductor. The brass electroplate shall be comprised of 74 to 81 percent copper. A suitable adhesive may be used in lieu of the brass coating for bonding the insulation to the conductor.

3.1.2 Insulation. Each conductor of the cable shall be insulated with styrene butadiene rubber (SBR). The insulating compound shall conform to MIL-I-3930, type IS, except that the testing of the insulation shall be performed on press cures of the insulating compound. (See 4.3) The insulation on each conductor shall have a D-shaped cross section. Two such insulated conductors with the flat faces of the D-shaped insulations in contact shall form the pair. The two conductors may be insulated simultaneously, in which case the two insulated conductors shall be joined by an integral fin of the insulating compound located midway of the abutting flat faces. The thickness of this fin shall be such that, when the two conductors are pulled apart, the insulation will part at the fin without reducing the thickness of insulation on either conductor below the minimum value of 0.025 inch. The insulations on the two conductors shall register to yield in the pair, an oval cross section. In the finished cable, the flat faces of the two insulated conductors shall be in intimate contact. The diameter of each insulated conductor, measured either parallel or perpendicular to the flat face of the D-shaped cross section shall be 0.110 inch, $\pm$0.005 inch. The conductor shall be well centered in the insulation. Within the limits of good manufacturing practice, the plane of the contacting interface of the two insulated conductors shall be perpendicular to the major axis of the cable; this interface shall be midway in the overall width of the cable.

3.1.2.1 Insulation repairs. Faults in the insulation developed during processing or testing may be repaired, but all lengths of cable containing such repairs shall meet the requirements of this specification. In making such repairs, the insulation shall be removed by tapering cuts on each side of the defect. The cuts shall not nick the conductor. The bared conductor shall be wrapped with a high grade SBR or rubber insulating tape in thin layers until the diameter of the taped section is equal to the original insulation diameter, and then vulcanized. The patch shall be fully bonded to the original insulation.

3.1.3 Cotton cover. After vulcanizing, the two insulated conductors shall be covered with a single braid or serve which, with the exception of the marking strands (see 3.10.2) shall be unbleached cotton yarn. The yarn shall be No. 10, 2-ply (10/2). If a braid is employed, it shall be formed of 16 carriers, having one yarn per carrier. The number of turns of each yarn per foot length of cable shall be not less than 16. If a serve is employed, it shall be formed of 16 yarns. The number of turns of each yarn per foot length of cable shall be no less than 12. The cotton cover shall be smooth and of regular construction.

3.1.3.1 Cotton-cover repairs. Where defects in the cotton cover occur as from breakage of some of the yarns, the loose yarn ends shall be lashed down with a single serve of 5-1/2 mil adhesive glass tape. When more than 2 yarns are missing from the braid or serve, the glass tape serve shall cover at each end of the defective section not more than 1 inch. There shall be not more than 8 missing yarns, and sections of cover having missing yarns shall be not more than 1 foot in length. Loose ends of yarn more than one-sixteenth of an inch in length and overlaps in the cover are not permissible. All knots employed in joining yarns shall be small and free ends shall be clipped short. Short sections in which the cover is missing may be repaired. The yarn ends shall be secured and the bared section served with glass tape in the manner specified for sections having broken yarns. Sections of insulated conductors from which the cover is missing shall not exceed 1 inch in length. Sections of the cotton cover removed in making a repair in the jacket shall be repaired by the use of a glass tape as indicated above.

3.1.4 Jacket. A jacket of chloroprene rubber compound (see 3.1.4.2) shall be tightly applied over the cotton-covered conductors. The compound shall penetrate the interstices of the cotton cover and shall adhere to the underlying insulation. The insulated conductors shall be so positioned in the jacket as to yield optimum uniformity in the jacket thickness. The thickness of the chloroprene rubber jacket shall be 0.040 inch; the thickness of the jacket as removed from the completed cable shall be not less than 0.030 inch. The desired shape of the completed cable at any right-section comprises semi-circular edges, and the opposite faces approximately flat and parallel. The cross-section of the completed oval shaped cable shall have a major axis of 0.320 $\pm$0.010 inch, and a minor axis of 0.210 $\pm$0.010 inch.

3.1.4.1 Jacket repairs. Faults in the jacket developed during processing or testing may be repaired but unless otherwise specified herein, all lengths of cable containing such repairs shall meet the requirements of this specification.

In making such repairs in the jacket, the jacket shall be removed by tapering cuts on each side of the defect. The cuts shall not nick the insulation or cotton cover. The cotton cover shall be wrapped with a chloroprene rubber jacketing tape until the taped section is approximately equal to the major axis dimension of the cable (see 3.1.4), and then vulcanized. The patched section shall not exceed 3-1/2 inches in length and 0.350 inch maximum over the major cross-sectional axis and a maximum of 0.240 inch for the minor axis. Edges of the patch shall be well rounded and the ends tapered down and fully bonded to the original jacket.

3.1.4.2 Physical properties of jacket. (See 4.5.4 and 4.5.4.1.) The physical properties of the chloroprene rubber jacket, free from cotton yarn, shall conform to MIL-I-3930, type JN, except as specified in table I below; also, the tensile stress test at 200 percent elongation (after oil immersion), specified in MIL-I-3930, is not applicable.

TABLE I. Physical properties of jacket

Physical property	Unaged	After 48 hrs aging	After 10 days aging
Tensile strength, min, psi	1600	1500	1000
Elongation at rupture, min percent	300	250	100
Tension set in 2 inches, max, in.	3/8	-	-

3.2 Adhesion. (See 4.5.2.)

3.2.1 Adhesion of insulation. When tested as specified in 4.5.2.1, the adhesion of the insulation to the conductors (measured on specimens of insulated conductors removed from the completed cable without injury to the insulation) shall be such that a force of not less than 12 pounds, applied parallel to the axis of the conductors, will be required to strip a 3/8 inch length of insulation from the conductors.

3.2.1.1 Adhesion of insulation after aging. The adhesion of insulation after aging (see 4.5.2.1.1) shall average not less than 90 percent of the unaged values of these specimens. (See 3.2.1.)

3.2.2 Adhesion of jacket and insulation in the completed cable. The adhesion of the jacket to the insulation and the insulation to the conductors in the completed cable shall be such as to withstand a load equal to the breaking load of the completed cable applied parallel to the axis of the conductors without buckling or rupture of the insulation or jacket, or slippage of the conductors when tested as specified in 4.5.2.2.

3.3 Compression of insulation.

3.3.1 Compression of unaged insulation. Specimens of unaged single insulated conductors shall withstand, without crushing, a load of not less than 800 pounds, when tested in accordance with 4.5.3.

3.3.2 Compression of insulation after 48 hours accelerated aging. Specimens of single insulated conductors shall be subjected for 48 hours to the accelerated aging specified in 4.5.3.1, and shall withstand, without crushing, a load of not less than 800 pounds, when tested in accordance with 4.5.3. The crushing load shall be not less than three-fourths of the value obtained from unaged specimens from the same unit of product.

3.3.3 Compression of insulation after 10 days accelerated aging. Specimens of single insulated conductors shall be subjected for 10 days to the accelerated aging specified in 4.5.3.1, and shall withstand, without crushing, a load of not less than 500 pounds, when tested in accordance with 4.5.3. The crushing load shall be not less than one-half of the value obtained from unaged specimens from the same unit of product.

3.4 Cold bend. The conductor insulation and cable jacket of the completed cable shall exhibit no visible signs of cracks, flaws or other damage when tested as specified in 4.5.5.

3.5 High-voltage spark. All of the completed cable shall withstand without dielectric failure, a spark test potential of not less than 8,800 volts rms, applied for not less than 0.4 second, when tested as specified in 4.5.6. A certification to the effect that the spark test has been performed shall accompany the cable when it is submitted for acceptance.

3.6 Electrical characteristics during water immersion. The completed cable shall meet the requirements of dielectric withstanding voltage, insulation resistance and mutual capacitance as specified in 3.6.1, 3.6.2 and 3.6.3, respectively, while immersed in tap water.

3.6.1 Dielectric withstanding voltage. When tested as specified in 4.5.7.1, each conductor shall show no evidence of breakdown of insulation.

3.6.2 Insulation resistance. The insulation resistance of each conductor shall be not less than 1,000 megohms per thousand feet at, or corrected to +60°F, when tested as specified in 4.5.7.2.

3.6.3 Mutual capacitance. The mutual capacitance of the cable shall be not more than 0.053 microfarad per 1,000 feet, when tested as specified in 4.5.7.3.

3.7 Direct current resistance. The dc resistance of each conductor of the cable shall be not more than 24.2 ohms per 1,000 feet at, or corrected to +68°F, when tested as specified in 4.5.8.

3.8 Ozone resistance. When tested in accordance with 4.5.9, the cable jacket shall exhibit no visible signs of cracks, flaws or other damage. (See 6.3.)

3.9 Coils. (See 4.5.1.)

3.9.1 Coil lengths. The completed cable shall be wound in coils, each coil containing one continuous length of cable. Both ends of the cable length of each coil shall be readily accessible. The nominal length of cable per coil shall be 1,000 ±25 feet. The minimum acceptable length shall be 100 feet and the maximum acceptable length shall be 1,200 feet. The desired number of coils for any order shall be determined by dividing the total footage of the order by 1,000 feet. The maximum number of coils shall not exceed the desired number by more than 20 percent. Not more than 5 percent of the total number of coils in a lot shall have a length less than 500 feet.

3.9.2 Coil formation. The coils of cable, as formed, shall have an eye capable of receiving a mandrel 14-1/2 inches in diameter. The traverse in coiling shall be not greater than 4-1/4 inches. The mean outside diameter of coils of completed cable, unwrapped, shall be not greater than 24 inches.

3.10 Marking. (See 4.5.1.)

3.10.1 Distinguishing ridge marks. In order that the two insulated conductors of the cable may be readily distinguished from each other, the chloroprene rubber jacket shall contain two longitudinal ridges which are readily perceptible to the eye and to the touch. The two ridge tracers shall be located on one edge of the cable, one being approximately 45° above and the other approximately 45° below the major axis of the cable cross section. The tracers shall be continuous throughout the length of the cable. They shall be of such size and so positioned as not to increase the major or minor dimensions of the completed cable, as normally measured.

3.10.2 Marker yarns. Colored marker yarns shall be used to indicate the year of manufacture, and the supplier. The color code to be used for identification of the supplier shall be designated by the Contracting Officer. (See 6.2(e)). The colored marker yarns indicating the year of manufacture shall be in accordance with table II. The color cycle is repeated every five years.

TABLE II. Year of manufacture identification

Year of manufacture			Identifying color
	1975	1980	White
1971	1976	1981	Red
1972	1977	1982	Green
1973	1978	1983	Orange
1974	1979	1984	Blue

3.11 Workmanship. Cables shall be constructed and finished in a throughly workmanlike manner in accordance with accepted high grade production techniques. The cables shall be a uniform and consistent product and shall be free from any defects which will adversely affect the serviceability of the product, such as lumps, kinks, splits, abrasions, scrapes, corroded surfaces, skin impurities and faulty extruded surfaces.

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 in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by 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.

4.1.1 Inspection equipment and facilities. Inspection equipment and facilities shall be established and maintained in accordance with MIL-C-45662.

4.2 Classification of inspections. The examinations and tests of cables are classified as follows:

(a) Materials inspection. (See 4.3.)
(b) Quality conformance inspection. (See 4.4.)
    1. Inspection of product for delivery. (See 4.4.1.)
    2. Inspection of preparation for delivery. (See 4.4.5.)

4.3 Materials inspection. Materials inspection shall consist of certification supported by verifying data that the materials listed in table III, used in fabricating the cable (see 3.1), are in accordance with the applicable referenced specifications and requirements prior to fabrication, except that the tests on the jacket (see 3.1.4.2) shall be performed on jacketing removed from the completed cable.

TABLE III. Materials inspection

Material	Requirement paragraph	Applicable specification
Conductor	3.1.1	QQ-W-345, Type II
Conductor coating	3.1.1.1	ASTM B 189-63
Insulation	3.1.2	MIL-I-3930, Type IS
Cotton cover	3.1.3	-
Jacket	3.1.4.2	MIL-I-3930, Type JN

4.4 Quality conformance inspection.

4.4.1 Inspection of product for delivery. Inspection of product for delivery shall consist of groups A, B and C inspection.

4.4.1.1 Inspection lot. An inspection lot shall consist of all cables of the same type (see 3.1) produced under essentially the same conditions and submitted for inspection at the one time.

4.4.1.2 Unit of product. Unless otherwise specified in the contract or order, the unit of product for purposes of sampling shall be each continuous length of cable contained on a reel, spool or coil.

4.4.1.3 Sample. The sample shall consist of that number of randomly selected units of product required by the applicable sampling plan for the presented lot.

4.4.1.4 Selection of sample units. Sample units for inspection shall be taken from each unit of product which forms part of the sample. A sample unit is defined as a length of cable drawn from a unit of product.

4.4.1.5 Test specimen. A test specimen may be the entire sample unit (length of cable) or any portion of the sample unit which is to be tested.

4.4.2 Group A inspection. Group A inspection shall include the examinations and tests specified in table IV.

4.4.2.1 Sampling plan. Statistical sampling and inspection shall be in accordance with MIL-STD-105 for general inspection level II. The acceptable quality level (AQL) shall be as specified in table IV. Major and minor defects shall be as defined in MIL-STD-105.

4.4.2.2 Rejected lots. If an inspection lot is rejected, the supplier may withdraw the lot from further inspection. The supplier may also rework a rejected lot to correct the defects or screen out the defective units and reinspect the lot using tightened inspection. Rejected lots shall be kept separate from new lots and shall not lose their identity.

TABLE IV. Group A inspection

Examination or test	Requirement paragraph	Test method paragraph	AQL	
			Major	Minor
Visual and dimensional:				
Conductor	3.1.1	4.5.1	1.0% for the group	4.0% for the group
Insulation	3.1.2			
Cotton cover	3.1.3			
Jacket	3.1.4			
Coils	3.9			
Marking	3.10			
Workmanship	3.11			
Electrical:				
Dielectric withstanding voltage	3.6.1	4.5.7.1	1.0% for the group	*
Insulation resistance	3.6.2	4.5.7.2		
Mutual capacitance	3.6.3	4.5.7.3		
DC resistance	3.7	4.5.8		

*All electrical defects are considered major.

4.4.3 Group B inspection. This inspection, including sampling shall conform to table V and to the procedures for small-sample inspection of MIL-STD-105, using special inspection levels. Group B inspection shall be performed on inspection lots that have passed Group A inspection and on specimens selected from units of product that have been subjected to and met the Group A inspection. The AQL shall be 6.5 (percent defective), and the special inspection level shall be S-2.

TABLE V. Group B inspection

Examination or test	Requirement paragraph	Test method paragraph
Insulation:		
Adhesion	3.2.1	4.5.2.1
Compression, unaged	3.3.1	4.5.3
Compression, after 48 hours aging.	3.3.2	4.5.3, 4.5.3.1
Jacket:		
Physical properties, unaged and after 48 hours aging.	3.1.4.2	4.5.4, 4.5.4.1
Cable:		
Adhesion of jacket and insulation.	3.2.2	4.5.2.2
Cold bend	3.4	4.5.5

4.4.4 Group C inspection. Group C inspection shall consist of the examinations and tests specified in table VI. Group C inspection shall be made on sample units selected from inspection lots which have passed the groups A and B inspection.

TABLE VI. Group C inspection

Examination or test	Requirement paragraph	Test method paragraph
Adhesion of insulation after aging	3.2.1.1	4.5.2.1, 4.5.2.1.1
Compression of insulation after 10 days aging	3.3.3	4.5.3, 4.5.3.1
Physical properties of jacket after 10 days aging	3.1.4.2	4.5.4, 4.5.4.1
Ozone resistance	3.8	4.5.9

4.4.4.1 Sampling for inspection. Six test specimens for each Group C inspection shall be selected per 500,000 feet or fraction thereof of completed cable on order, without regard to their quality, except that the units inspected at the start of the contract shall be selected from the first units produced.

4.4.4.2 Disposition of sample units. Sample units which have been subjected to Group C inspection shall not be delivered on the contract or purchase order.

4.4.4.3 Noncompliance. No failures shall be allowed in Group C inspection. If a sample unit fails to pass Group C inspection, the supplier shall take corrective action on the material or process or both, as warranted, and on all units of product which can be corrected and which were manufactured under essentially the same conditions, with essentially the same materials, processes, etc., and which are considered subject to the same failure. Acceptance of the product shall be discontinued until corrective action, acceptable to the government, has been taken. After the corrective action has been taken, Group C inspection shall be repeated on additional sample units (all inspections or the inspection that the original sample failed, at the option of the government). Groups A and B inspection may be reinstituted; however, final acceptance shall be withheld until the Group C reinspection has shown that the corrective action was successful. In the event of failure after reinspection, information concerning the failure and the corrective action taken shall be furnished to the cognizant inspection activity and the qualifying activity.

4.4.5 Inspection of preparation for delivery. Sample packages or packs and the inspection of the preservation, packaging, packing and marking for shipment and storage shall be in accordance with the requirements of section 5.

4.5 Tests and examinations.

4.5.1 Visual and dimensional. The completed cables shall be visually and dimensionally examined to insure conformance in accordance with this specification. (See 3.1, 3.9, 3.10 and 3.11.)

4.5.2 Adhesion. (See 3.2.)

4.5.2.1 Adhesion of insulation. Specimens of the completed cable taken from each sample unit shall be inspected for compliance with 3.2.1. The specimens used in making this test shall have had the insulation removed from the conductors for several inches of its length and 3/8 inch length of insulation to be tested shall be at one end of the sample. The stripped conductors shall be passed through a die having an aperture not less than 0.050 inch and not more than 0.055 inch in diameter and the tension shall be applied to the conductors and the die. The tensile force shall be applied through a spring having a constant of approximately 6 pounds per inch moving away from the fixed end of the sample at a speed of approximately 6 inches per minute, or through an equivalent mechanical arrangement yielding approximately equal testing machine speed.

4.5.2.1.1 Adhesion of insulation after aging. Specimens of the insulated conductors from which the cotton covering and jacket have been removed without injury to the insulation, shall be tested in accordance with 4.5.2.1 after being subjected to the air-oven aging specified in method 4031 of FED-STD-228 at a temperature of 212°F for a period of 166 ±1 hour. The adhesion of insulation after accelerated aging shall conform to 3.2.1.1.

4.5.2.2 Adhesion of jacket and insulation in the completed cable. Specimens of the completed cable taken from each sample unit shall be tested for compliance with 3.2.2. The testing machine shall be equipped with parallel plate toggle type jaws with effective corrugated faces 2-1/2 inches in length and at least one-half inch in width. The rate of separation of the jaws shall be approximately 4 inches per minute. The jaws shall be set 9 to 12 inches apart prior to test. One end of the sample of completed cable shall be knotted and placed in one jaw. The second jaw shall be tightly clamped upon the sample in such a manner that the force will be applied directly in line with the conductors. The distance from the second jaw to the free end of the sample shall be 6 inches. Buckling of the jacket between the second jaw and the free end during test, or slippage of the jacket or insulation from the conductors at the free end, under load of less than the breaking load of the conductors, shall constitute a failure. Slippage of the jaws over the jacket shall not constitute a failure but shall call for a retest.

4.5.3 Compression of insulation. (See 3.3.) Each of the specimens of single insulated conductors, from which the cotton covering and jacket have been removed without injury to the insulation, shall be placed longitudinally between the parallel faces of two steel plates, the face of each plate being 2 inches in length. The specimen shall be so positioned that its flat face is either

perpendicular or parallel to the steel plates. A load resulting from decreasing the separation of the steel plates at an approximately uniform rate shall be applied to the specimen held between the plates until the insulation crushes. The speed of the compression testing machine shall be such that, when no specimen is between the steel plates, the rate of approach of the plates will be approximately 1-1/2 inches per minute. The crushing load shall be taken as that load which produces the initial abrupt reduction in the separation of the steel plates without a proportionate increase in load. The crushing load shall be determined at +73.4°F or, alternatively, shall be determined at a temperature between +50°F and +100°F and corrected to a temperature of +73.4°F. The temperature coefficient employed in correcting observed values to the reference temperature shall be approved by the government inspector for the specific compound employed.

4.5.3.1 Compression of insulation after aging. Specimens of single insulated conductors from which the cotton covering and jacket have been removed without injury to the insulation, taken from each sample unit, shall be tested in accordance with 4.5.3, after being subjected to the oxygen-bomb aging specified in method 4011 of FED-STD-228. The accelerated aging shall be continuous for the periods specified in 3.3.2 and 3.3.3, as applicable.

4.5.4 Physical properties of jacket. Test specimens of the cable taken from each sample unit shall be inspected for compliance with 3.1.4.2 and table I. Tests for tensile strength, elongation and tension set shall be in accordance with methods 3021, 3031 and 3161, respectively, of FED-STD-228. Accelerated aging of the test specimens shall be performed in accordance with 4.5.4.1.

4.5.4.1 Accelerated aging of jacket. Specimens of the jacket, removed from the completed cable for accelerated aging prior to testing (see 4.5.4), shall be subjected to the oxygen-bomb aging specified in method 4011 of FED-STD-228. The accelerated aging shall be continuous for the periods specified in table I, as applicable.

4.5.5 Cold bend. The test specimens of completed cable and insulated conductors, together with the test mandrels, shall be maintained in a cold chamber at -40° ±2°F for a minimum of 20 hours prior to the test. While still at the reduced temperature, and in the cold chamber, each specimen shall be wrapped around their respective test mandrel for a minimum of five turns at the rate of approximately one turn per second. The cable shall be wrapped around the test mandrel having a diameter of 3/8 inch and the insulated conductor shall be wrapped around the test mandrel having a diameter of 1/4 inch. At the conclusion of the wrapping operation, the cable jacket and conductor insulation shall be examined through a lens having a 3X magnification for conformance with 3.4.

4.5.6 High-voltage spark. The completed cable shall be spark tested in accordance with method 6211 of FED-STD-228 for compliance with 3.5.

4.5.7 Electrical characteristics during water immersion.

4.5.7.1 Dielectric withstanding voltage. The completed cable shall be tested for compliance with 3.6.1, in accordance with method 6111 of FED-STD-228, except that a potential of 2000 volts rms shall be maintained between each conductor and the surrounding water.

4.5.7.2 Insulation resistance. The completed cable shall be tested in accordance with method 6031 of FED-STD-228 for compliance with 3.6.2. The insulation resistance shall be computed from the galvanometer deflection obtained after an electrification of 1 minute, with the negative pole of the source of potential connected to the conductor. The galvanometer shall have a potential of 100 volts dc minimum. The insulation resistance may be measured prior to 1 minute, if the galvanometer ceases fluctuating, and the reading indicates that a steady or increasing resistance value has been obtained.

4.5.7.3 Mutual capacitance. The capacitance between each pair of conductors of the completed cable shall be measured with a capacitance bridge at a frequency of 900 to 1,000 Hz, and shall meet the requirements of 3.6.3.

4.5.8 Direct current resistance. The dc resistance of the completed cable shall be measured in accordance with method 6021 of FED-STD-228, for compliance with 3.7.

4.5.9 Ozone resistance. Three test specimens of cable shall be bent 180 degrees around a mandrel that has a diameter four times greater than the diameter of the cable. The cable may be removed from the mandrel after bending, provided the bend of the cable is maintained at 180 degrees. Prior to placing the test specimens into the ozone chamber, the test specimens shall be wiped with a clean cloth to remove dirt, sweat, and surface moisture. The test specimens shall be exposed to the ozone in accordance with ASTM D-1149-64, except that the air shall have an ozone concentration of 50 $\pm$3 parts per 100,000,000 (by volume) and shall be circulated at 120°F for a period of 7 days. Upon removal from the ozone chamber, the test specimens shall be examined under a seven-power optical magnifier for conformance with 3.8.

5. PREPARATION FOR DELIVERY

5.1 Preservation and packaging. No preservation and packaging is required.

5.2 Packing. Packing shall be level A, B or C, as specified. (See 6.2(b))

5.2.1 Level A. Four coils of cable, each coil 1,000 feet in length unless otherwise specified, shall be packed in a close-fitting box conforming to PPP-B-585, class 3.

5.2.2 Level B. Unless otherwise specified, the cable shall be uniformly coiled and packed in 1,000 foot lengths. Each coil shall be packed in a close fitting box conforming to PPP-B-636, style FTC or HSC, grade 275 minimum. Each box shall be provided with a special "knock-out" feature centered on the cover to provide for "feedout" of wire from the center of the coil. Closure of box shall be by application of two straps or two 1-inch strips of tape as described in the appendix to PPP-B-636. Care shall be exercised to prevent the straps or tape from interfering with the "knock-out" feature.

5.2.2.1 When specified for military agency procurements, Level B packing shall consist of four coils of cable placed in a wirebound box conforming to PPP-B-585, Class 1.

5.2.3 Level C. The cable shall be packed for shipment in accordance with the manufacturers standard practice providing that it insures protection for the cable during shipment and safe delivery to its destination in containers that will assure carrier acceptance and safe arrival at destination in compliance with the Uniform Freight Classification or the National Motor Freight Classification.

5.3 Marking. Marking shall be in accordance with 5.3.1 or 5.3.2, as specified. (See 6.2(c).)

5.3.1 Civil agencies. In addition to any special marking required by the contract or order, the containers shall be marked in accordance with Fed. Std. No. 123.

5.3.2 Military agencies. In addition to any special marking required by the contract or order, the containers shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use. Telephone cable W-108-B is intended for use as telephone drop wire.

6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in procurement documents:

(a) Title, number, and date of this specification and any amendment thereto.

(b) Level of packaging and level of packing required for shipment (Level A, Level B, or Level C).

(c) The specific paragraphs of section 5 which are applicable to the particular procurement.

(d) Place of final inspection.

(e) Supplier's color code identification. (See 3.10.2.)

6.3 Information on antiozonants. Experience has shown that jacket compounds containing 3 parts of an acceptable antiozonant such as (N'N' Di-3) (5 methyl keptyl) p-phenylene diamine and proper quantities of wax in 100 parts of the rubber have passed the test satisfactorily. This information is not a requirement of this specification.

MILITARY INTEREST:
C

Custodians:
Army - EL
Navy - YD
Air Force - 17

Review activities:
Army - EL
Navy - SH
Air Force - 80
NSA
DSA - IS

User activity:
Navy - CG

Preparing activity:
Army - EL

Project 6145-0458

CIVIL AGENCIES INTEREST:
GSA-FSS
PO
DC
AG
COM

☆ U. S. GOVERNMENT PRINTING OFFICE : 1971 O - 436-362 (2392)

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