INCH-POUND

MIL-DTL-87218A
15 August 1997
Superseding
MIL-C-87218
22 February 1985

DETAIL SPECIFICATION
CABLE, LOCKCLAD, FOR AIRCRAFT CONTROL

This specification is approved for use by all Departments
and Agencies of the Department of Defense

1. SCOPE

1.1 Scope. This specification covers the requirements for Lockclad control cable material used in aircraft flight controls and aircraft control cable assemblies which include Lockclad as a portion of the assembly. Lockclad is defined as the resulting material of swaging aluminum alloy tubing onto MIL-DTL-83420 Type I nonjacketed wire rope to the extent necessary to comply with the elongation and coefficient of thermal expansion properties specified herein.

1.2 Classification. The Lockclad should be of the following types and classes as specified.

Type I -	Lockclad manufactured with MIL-DTL-83420 Type I Composition A carbon steel, zinc or tin over zinc coated wire rope.
Type II -	Lockclad manufactured with MIL-DTL-83420 Type I Composition B corrosion resistant steel wire rope.
Classes -	Classes of Lockclad have been assigned for various base cable sizes and construction and aluminum cladding outside diameter for ease of reference. These classes are identified in Table I.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, weather or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Defense Industrial Supply Center, attn.: DISC-EED, 700 Robbins Avenue, Philadelphia, PA 19111-5096. by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter

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SPECIFICATIONS

FEDERAL

WW-T-700/6	-	Tube, Aluminum Alloy, Drawn, Seamless, 6061 and 6062

DEPARTMENT OF DEFENSE

MIL-DTL-781	-	Terminal; Wire Rope Swaging
MIL-DTL-5688	-	Wire Rope Assemblies; Aircraft, Proof Testing and Prestretching of
MIL-DTL-6117	-	Terminal-Cable Assemblies Swaged Type
MIL-C-11796	-	Corrosion Preventive Compound, Petrolatum Hot Application
MIL-C-16173	-	Corrosion Preventive Compound, Solvent Cutback, Cold-Application
MIL-DTL-83420	-	Wire Rope, Flexible, for Aircraft Control

STANDARDS

DEPARTMENT OF DEFENSE

MIL-STD-1599	-	Bearings, Control System Components, and Associated Hardware Used in the Design and Construction of Aerospace Mechanical Systems and Subsystems
MS20667	-	Terminal, Wire Rope, Swaging, Fork End
MS20668	-	Terminal, Wire Rope, Swaging, Eye End

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Standardization Documents Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Order of precedence. In the event of conflict between the text of this document and the references cited herein, The text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Qualification. Lockclad material furnished under this specification should be products that are qualified for listing on the applicable qualified at the time set for opening of bids (see 4.2.3 and 6.6). Any change in product design, description, materials, or processing procedures (see 4.2 and 6.6) shall require requalification of the product to an extent determined by the qualifying activity.

3.2 Materials

3.2.1 Base wire rope. Base wire rope shall be in accordance with MIL-DTL-83420.

3.2.2 Aluminum cladding. The aluminum cladding of lockclad shall be 6061-T4 extruded aluminum alloy tubing, conforming to WW-T-700/6, of uniform quality and thickness, clean, smooth, and free of defects or foreign materials. The original tubing size and wall thickness shall be selected by the lockclad manufacturer as required to manufacture which will meet the requirements set forth herein.

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3.2.3 Lubricants. Lubricants required in wire rope shall not be removed prior, during, or after swaging operations. Lubricants added to the interior of the tubing prior to swaging shall be chemically compatible with lubricant in the base cable. Lubricants applied to the exterior of the aluminum or to the swaging tooling prior to swaging shall be removed after swaging and prior to shipment of lockclad control cable assemblies.

3.3 Design and construction

3.3.1 Design. The application and installation of the lockclad cable shall be as stated in requirement 206 of MIL-STD-1599.

3.3.2 Construction.

3.3.2.1 Base wire rope construction. Construction of base wire rope shall be in accordance with MIL-DTL-83420.

3.3.2.2 Lockclad diameter. The aluminum tubing shall be uniformly cold worked (swaged) over the base wire rope to the dimension specified in Table I and sufficiently to meet the performance requirements herein. The length, location, and length tolerances of cladding on a base wire rope length shall be as specified on the Lockclad control cable assembly drawing or standard sheet. Tolerance of the outside diameter of the Lockclad after swaging shall be as specified in Table I. Sections of Lockclad which are not separated on the control cable assembly drawing or standard sheet shall be one continuous section of aluminum tubing as opposed to two or more sections. The Lockclad assembly shall be straight within .062 inch for each 5 feet of length when the Lockclad assembly is loaded to 10% Minimum Breaking Strength (MBS) of the base cable. MBS shall be in accordance with MIL-DTL-83420.

3.3.2.3 Lockclad concentricity. The cladding after swaging shall be concentric around the base wire rope such that the thickness of the clad material does not vary more than 10 percent around the circumference of the base wire rope. Relative to Lockclad control cable assemblies which include sections of bare base wire rope, the after swage lengths of cladding must be determined prior to swaging. Once cladding has been swaged, it shall not be stripped from base wire rope under any circumstances or in any amount.

3.4 Performance.

3.4.1 Breaking strength. The cladding of Lockclad shall not be considered to be additive to the minimum breaking strength (MBS) of the base wire rope whether terminals are swaged to the base wire rope or directly to the cladding. The MBS for the base wire rope is specified in MIL-DTL-83420. Lockclad assemblies shall be tested for ultimate tensile strength per MIL-DTL-6117.

3.4.2 Elongation. The clad portion of all Lockclad material and control cable assemblies furnished in accordance with this specification shall be in accordance with the elongation and SV values specified in Table II. For use herein, SV is defined in paragraph 6.3.2.

3.4.3 Coefficient of Thermal Expansion. The clad portion of all Lockclad material furnished in accordance with this specification shall be in accordance with the values specified in Table II.

3.4.4 Endurance. The bare base wire rope portions of Lockclad cable assembles shall meet the endurance requirements of MIL-DTL-83420. The clad portions of Lockclad assemblies are not subject to flexing or bending by application and are not subject to endurance requirements.

3.4.5 Proof Loading. All Lockclad control cable assemblies shall be proof loaded to 60 percent of the base wire rope MBS listed in MIL-DTL-83420 in accordance with MIL-DTL-5688.

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3.4.6 Temperature Limits. The base wire rope and the cladding after assembly into Lockclad shall meet the temperature requirements specified in MIL-DTL-83420 for the wire rope. The cladding or swaging of the cladding shall maintain properties specified herein in a temperature environment of -65°F to 200°F.

3.4.7 Weight. The finished Lockclad material shall not exceed the maximum weight specified in Table I.

3.5 Identification.

3.5.1 Lockclad Assemblies. As a minimum and unless otherwise specified by the Procuring Agency, the following information shall be marked with permanent ink, chemical etching, or electro- etching on the outside diameter of the cladding in an axial direction of all Lockclad assemblies starting not less than one inch nor more than six inches from one end of the cladding or one section of cladding nearest a terminal:

The complete part or assembly number of the Lockclad assembly as specified on the assembly drawing or standard.

The Lockclad manufacturer's name, trademark, or Commercial And Government Entity Codes (CAGEs). If the latter is used, the five digit code must be preceded by the letters "CAGE". More than one method may be used.

3.6 Workmanship. All details of workmanship and finish shall be in accordance with the best practice of aircraft quality. Unclad lengths of wire rope of Lockclad assemblies shall meet the workmanship requirements of MIL-DTL-83420 before and after swaging of the cladding material and terminals. In addition, the cladding and assemblies shall conform to paragraphs 3.6.1 and 3.6.2.

3.6.1 Cladding after swaging. There shall be no kinks, bends, or abrupt changes in direction of the cladding. There shall be no scratches, die marks, flat spots, or discontinuities in the finished cladding when inspected with the unaided human eye.

3.6.2 Lockclad Control Cable Assemblies. At all transition points of cladding and bare base wire rope there shall be no kinks, abrupt changes in direction, broken wires, or other evidence of damage to the base wire rope.

4. VERIFICATION

4.1 Classification of inspection. The inspection and testing of the base wire rope shall conform to the requirements of MIL-DTL-83420. The inspection and testing of the cladding and assemblies of Lockclad shall be classified as follows:

a. Qualification inspection (See 4.2)
b. Quality conformance inspection (See 4.3)

4.2 Qualification inspection.

4.2.1 Qualification test sample. The number of samples shall be as specified in Table IV.

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4.2.2 Specimen for breaking strength test for swaging of cladding. Three assemblies of each type and class of lockclad for which qualification is desired (types and classes per table I) shall be manufactured in the following configuration using equipment and procedures which will be or are being used for production lots:

Length of cladding: 4 to 10 feet
Overall length of assembly: 1 to 2 feet longer than cladding.
Cladding shall be approximately centered over the overall length of the assembly.
Terminals: Swage 1 MS20667 or MS20668 terminal on each end of the lockclad assembly.
Proof loading: Proof load each of the three assemblies to 60 percent MBS of the base cable per MIL-DTL-5688.

4.2.3 Qualification Testing. The qualification tests shall include all of the examinations and tests designated in Table III.

4.2.4 Retention of qualification. To retain qualification, the manufacturer shall forward certification at 2-year intervals to the qualifying activity stating that the company still has the capabilities and facilities necessary to produce the item and that the product has not been changed in any way. The qualifying activity shall establish the initial reporting date.

4.2.5 Rejection and retest. The failure of any specimen during qualification testing shall be cause for complete re-qualification of the type and class of lockclad experiencing failures.

4.3 Quality conformance testing. Quality conformance testing of lockclad cable shall consist of individual tests and a sampling plan.

4.3.1 Individual test. Individual test shall consist of the following:

Examination of product (4.4.1)

4.3.2 Sampling plan. The sampling plan shall consist of the following:

Breaking strength (4.4.2.1)
Proof loading (4.4.5)
Concentricity (4.4.8, 4.4.8.1)
Straightness (4.4.9)

4.3.2.1 Sampling. When conducting the tests specified herein, with the exception of examination of product, samples of Lockclad may be specially manufactured for qualification testing and shall be taken from each lot to be delivered for quality conformance testing. Sample size shall be specified for each test.

4.3.2.2 Lot. A lot shall consist of not more than 110 lockclad control cable assemblies or 110 pieces of lockclad material manufactured from the same manufacturer's lot of base wire rope and manufactured continuously by one machine or by one series of progressive processing machines. All items in a lot shall be of the same outside diameter cladding.

4.3.2.3 Specimen. A specimen is a lockclad assembly or portion of an assembly or lockclad material taken for the performance of a testing method. All specimens for qualification testing shall be taken from the same lot for each particular size. All specimens for quality conformance testing shall be taken from the lot to be delivered on a specific contract.

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4.3.3 Rejection. The failure of any specimen shall be cause for rejection of the lot represented.

4.4 Test method

4.4.1 Examination of Product. All Lockclad and bare base wire rope, as applicable, shall be examined for identification, workmanship and finish to determine compliance with 3.5, 3.6, 3.6.1. and 3.6.2. Terminals shall be examined for conformance with the workmanship requirements of the appropriate specification or standard.

4.4.2 Breaking Strength.

4.4.2.1 Breaking strength test. For Lockclad furnished as assemblies with terminals, two assemblies from each lot of 40 or less assemblies or three assemblies for each lot of 41 to 110 assemblies shall be loaded, by gripping the terminals at each end, in tension to the MBS of the size and type base wire rope used in the manufacture of Lockclad. The MBS is specified in MIL-DTL-83420. Terminal slippage, broken wires in the bare portions of the base wire rope in excess of those allowed by MIL-DTL-83420 or MIL-DTL-6117, longitudinal or circumferential cracking of the cladding, or wire rope breakage, are cause for rejection of the lot. This test shall comply with all requirements of MIL-DTL-6117. Assemblies used for this test shall be destroyed.

4.4.2.2 Breaking strength test for qualification. Load each lockclad assembly, by gripping the terminals, in tension to failure of some component of the assembly. Successful completion of the test requires that all three assemblies (see 4.2.2) fail in the base wire rope at or above the MBS for the wire rope.

4.4.3 Elongation. Three lockclad control cable assemblies similar to those manufactured per 4.3.2.1 shall be manufactured for the qualification test. Specimens shall be gripped at the terminals and loaded to not more than 1 percent MBS of the base wire rope. The elongation shall be determined as follows:

Designate and measure a length of not less than one foot of cladding on each assembly. Gradually increase the tension load to 60 percent MBS of the base wire rope. Measure the length of the designated section of cladding at not more than each 5 percent MBS increment. The elongation at the appropriate loads shall be within the elongation values specified in Table II for all 3 specimens. The SV values shall be calculated and shall fall within the SV values specified in Table II for all 3 specimens.

4.4.3.1 5 year elongation qualification testing. For qualification testing, the test as specified in 4.4.3 shall be repeated each 5 year period or following any major change of tooling or processing procedures or change of aluminum tubing wall thickness, whichever is earlier.

4.4.4 Coefficient of thermal expansion check. Three specimens shall be prepared for each Type and Class of Lockclad for which qualification is desired. Specimens may be continuous Lockclad or may terminate in bare base wire rope with terminals swaged thereon. Designate and measure a length of not less than 2.5 feet of cladding on each assembly. Specimens shall be tested for determination of the change in length due to temperature changes. The specimens shall be tested by measuring the Lockclad length at 32°F $\pm$ 1°F and raising the temperature to 80"F $\pm$ 1°F while measuring the Lockclad length at each 10°F increment as a minimum. The coefficient of thermal expansion shall be calculated from these data and all values shall fall within the values specified in Table II.

4.4.4.1 Thermal expansion qualification testing. For qualification testing, the test as specified in 4.4.4 shall be repeated, if there are any major change of tooling or processing procedures or change of aluminum tubing wall thickness, whichever is earlier.

4.4.5 Proof Loading. All Lockclad control cable assemblies furnished under a contract shall be proof loaded, by gripping the terminals at the two ends, to 60 percent MBS of the base wire rope per MIL-DTL-5688.

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4.4.6 Qualification test for temperature limits. Three specimens shall be manufactured as specified in 4.4.3. The specimens shall be loaded in tension to 60 percent MBS and the elongation determined while the temperature is -65°F, +5°, -0° and again at 200°F, +5°, -0°. The elongation shall be within 20 percent of the elongation limits specified in Table II.

4.4.7 Qualification test for weight. At least three sections of Lockclad material not less than 2 feet in length manufactured at the same time of the same materials and processes shall be weighed. Weight shall not exceed the maximum weight specified in Table I.

4.4.8 Concentricity. Three Lockclad assemblies shall be sectioned approximately in the middle of the Lockclad. A .10 to 1 inch section may be removed. The section may be mounted. The thickness of the clad shall be measured at four points on the diameter approximately 90° apart. The thinner of the four points shall not be less than 90 percent of the thickness of the thicker of the four points.

4.4.8.1 Qualification testing for concentricity. The test as specified in 4.4.8 shall be repeated each 5 year period or following any change in aluminum tubing wall thickness.

4.4.9 Straightness. The Lockclad assembly manufacturer is responsible for assurance that the straightness requirement specified in paragraph 3.3.2.3 is in compliance on all Lockclad control cable assemblies or Lockclad material delivered under a contract. Methods and frequencies of measurement shall be sufficient to assure this condition. Inspection may be accomplished during the proof loading procedure.

4.5 Identification of product. All lockclad control cable assemblies and lockclad material shall be inspected for appropriate marking prior to shipping. Marking shall comply with 3.5. Marking which does not comply shall be corrected and if not correctable within the requirements of 4.4.1, the lot shall be rejected.

4.3.5 Certification. For each government order or contract, the wire rope manufacturer shall certify that the product satisfactorily passed the quality conformance inspections of this specification. The certification shall include, as a minimum, actual results of the tests specified herein (see 6.6) and shall be retained on file at the manufacturer's facility for a minimum of 7 years.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department System Command. Packaging data retrieval is available from the managing Military Department or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature which may be helpful, but is not mandatory.)

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6.1 Intended use. The Lockclad control cable assemblies and Lockclad material covered by this specification are intended for use in aircraft control cable systems where low elongation under tension loads and/or a coefficient of thermal expansion more nearly matching that of a basically aluminum airframe is desired or required. Where these factors are not significant, unclad wire rope per MIL-DTL-83420 may be used for avoidance of the weight penalty of Lockclad.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.
b. Type and class of lockclad (1.2)
c. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2)
d. Packaging requirements (see 5.1)

6.3 Definitions. The definitions included herein apply to the terminology as used in this specification.

6.3.1 Effective Area. The cross sectional area of wire rope or Lockclad reflected as if the combination of wires or wires and aluminum were a solid metal mass.

6.3.2 SV Value. Stiffness may be expressed in terms of SV Values. The units for SV are lb-inch^2/inch^2, where "S" is the modulus of elasticity of steel, (30 X 10^6) and "V" is the Effective Area of the wire rope or Lockclad material. The SV value may be considered as the theoretical tensile load which would double the length if the material did not yield or fail in tension.

6.3.3 Coefficient of Thermal Expansion. The change in length of Lockclad material for each degree of temperature change in inches per inch.

6.3.4 Base Wire Rope. The wire rope per MIL-DTL-83420 over which aluminum tubing is swaged in order to manufacture Lockclad.

6.3.5 Bare Base Wire Rope. The term for the portions of a Lockclad control cable assembly where aluminum tubing is not swaged onto the wire rope. This area is also known as the "bare" sections of Lockclad control cable assemblies.

6.3.6 Lockclad. The term for the material resulting from the swaging of a tubing material over wire rope or aircraft control cable material in such manner as to reflect a lower elongation under tensile loading than the wire rope without the swaged cladding.

6.3.7 Outside Diameter of Lockclad. The diameter of the exterior of the cladding after swaging onto the wire rope.

6.3.8 Minimum breaking strength MBS. The minimum breaking strength of the base wire rope of Lockclad. The cladding material should not be considered additive to the tensile strength of Lockclad assemblies.

6.3.9 Transition Point. The point at which base wire rope extends beyond the cladding of Lockclad control cable assemblies.

6.3.10 Swaging. The process of cold working the cladding material onto the base wire rope to such intimate contact as necessary to meet the requirements of this specification for Lockclad.

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6.3.11 Deflection. Elongation of a specified length of wire rope or Lockclad under a specified tension load.

6.4 Subject term (key word) listing.

Sheathing
Sheathed wire rope assemblies
Aluminum sheathed wire rope

6.5 Applicable Calculations.

6.5.1 SV Value. The SV Value may be determined by use of the following formulae:

$SV = E(A_f)$, $\delta = \frac{PL}{EA_f}$ or $e = \frac{P}{EA_f}$ and

Where: δ = Change in total length under P load.
P = Load in pounds.
L = Length of wire rope or Lockclad.
E = Young's Modulus of Elasticity for the base wire rope material (30×10^6).
A_f = Effective Area of the wire rope or Lockclad.

$e = \frac{\delta}{L}$ = Elongation of wire rope or Lockclad in inch/inch at P load.

6.5.2 Elongation. Elongation may be calculated by use of the formula:

$e = \frac{P}{EA_f}$ or $e = \frac{\delta}{L}$ (see 6.5.1)

6.5.3 Effective Area. Effective area may be calculated by use of the formula:

$A_f = \frac{P}{Ee}$ or $A_f = \frac{PL}{E\delta}$ (see 6.5.1)

6.6 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Product List QPL-87218 whether or not such products have actually been so listed by that date. The attention of contractors is called to these requirements, and manufacturers are urged to arrange to contact the activity responsible for the Qualified Products List to determine the specific requirements that must be met for qualification. The activity responsible for the Qualified Products List is Defense Industrial Supply Center, 700 Robbins Avenue, Philadelphia, PA 19111-5096 and information pertaining to qualification of products may be obtained from that activity.

6.7 Swaged terminals.

6.7.1 Attached to base wire rope. In assemblies designed to leave an extension of base wire rope at one or both ends and terminals are swaged directly onto the base wire rope, terminals in accordance with MIL-T-781 should be swaged in accordance with the appropriate terminal standard drawings.

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6.7.2 Swaged over cladding. In assemblies designed for cladding the complete length, special non-standard terminals may be swaged directly to the cladding. Special terminals and terminal swaging instructions should be as specified by the procuring agency for the lockclad control cable assemblies.

6.8 Changes to previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

TABLE I. Lockclad classes and physical properties.

CLASS IDENTITY	BASE WIRE ROPE 1/		FINISHED LOCKCLAD CLADDING DIAMETER INCH ± .003	LOCKCLAD WEIGHT MAX LB/100 FT.
	NOMINAL DIA. (IN) REF.	CONSTRUCTION (REF.)		
2A	.062 (1/16)	7 X7	.1495	2.60
2B	.062 (1/16)	7 X7	.1695	3.10
3A	.093 (3/32)	7 X7	.1695	3.80
3B	.093 (3/32)	7 X7	.2010	4.80
3C	.093 (3/32)	7 X 19	.1695	3.80
3D	.093 (3/32)	7 X 19	.2010	4.80
4A	.125 (1/8)	7 X 19	.2010	5.56
4B	.125 (1/8)	7 X 19	.2500	7.45
5A	.156 (5/32)	7 X 19	.2500	8.61
5B	.156 (5/32)	7 X 19	.2950	10.71
6A	.187 (3/16)	7 X 19	.2500	9.71
6B	.187 (3/16)	7 X 19	.2700	11.02
6C	.187 (3/16)	7 X 19	.2950	12.02
6D	.187 (3/16)	7 X 19	.3020	12.49
8A	.250 (1/4)	7 X 19	.3320	17.43
8B	.250 (1/4)	7 X 19	.3580	19.32
8C	.250 (1/4)	7 X 19	.3750	20.47

1/ Wire rope per MIL-DTL-83420 type I composition A or B.

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TABLE II. Lockclad performance properties.

CLASS (SEE TABLE I)	MAXIMUM PERCENT ELONGATION AT DESIGNATED LOAD		MINIMUM SV VALUE AT DESIGNATED LOAD X 10^3 (LB - $INCH^2$/$INCH^2$)				COEFFICIENT OF THERMAL EXPANSION (MINIMUM) 32 - 80°F (IN./IN. X 10^{-6} PER °F)	
			TYPE I LOCKCLAD*		TYPE II LOCKCLAD*			
	5% MBS	60% MBS	5% MBS	60% MBS	5% MBS	60% MBS	TYPE I*	TYPE II*
2A	.06	.4	111	166	111	166	11.9	12.2
2B	.06	.4	144	216	144	216	12.4	12.4
3A	.06	.4	165	247	157	235	11.1	11.3
3B	.06	.4	213	320	209	314	11.8	12.0
3C	.06	.4	165	247	157	235	11.1	11.3
3D	.06	.4	213	320	209	314	11.8	12.0
4A	.06	.4	237	355	228	343	10.4	10.5
4B	.06	.4	330	495	322	483	11.5	11.5
5A	.06	.4	372	558	362	543	10.6	10.7
5B	.06	.4	459	689	449	674	11.4	11.4
6A	.06	.4	402	603	382	573	9.3	9.3
6B	.06	.4	452	678	432	655	9.8	10.1
6C	.06	.4	501	751	482	723	10.3	10.4
6D	.06	.4	534	801	515	773	10.6	10.7
8A	.06	.4	720	1080	680	1019	9.5	9.7
8B	.06	.4	780	1170	741	1112	10.0	10.2
8C	.06	.4	870	1305	830	1246	10.3	10.4

* Type I or II Lockclad as specified herein; not to be confused with Type I or II wire rope per MIL-DTL-83420. All wire rope used in the manufacture of Lockclad is Type I per MIL-DTL-83420.

TABLE III. Qualification tests and quality conformance tests and inspections.

TESTS	REQUIREMENTS PARA	QUALIFICATION TEST PARA	QUALITY CONFORMANCE TEST PARA
Examination of product	3.6	4.4.1	4.4.1
Breaking strength	3.4.1	4.4.2.2	4.4.2.1
Elongation	3.4.2	4.4.3, 4.4.3.1	-----
Coefficient of thermal expansion	3.4.3	4.4.4, 4.4.4.1	-----
Proof loading	3.4.5	-----	4.4.5
Temperature limits	3.4.6	4.4.6	-----
Weight	3.4.7	4.4.7	-----
Concentricity	3.3.2.3	4.4.8	4.4.8, 4.4.8.1
Straightness	3.3.2.3	-----	4.4.9
Identification	3.5	-----	4.4.1

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TABLE IV. Summary of test specimens.

TEST	QUALIFICATION TESTING 1/ 2/ (Each Type and Class)			QUALITY CONFORMANCE TESTING		
	Paragraph	No. of Specimens	Comments	Paragraph	No. of Specimens	Comments
Examination of product	4.4.1			4.4.1	100% of all lots	
Breaking strength	4.4.2.2	3	5 to 12 foot length	4.4.2.1	2 of each lot of 40 or less: 3 of each lot of 41 - 110	Test only on Lockclad assemblies
Elongation	4.4.3 4.4.3.1	3	5 to 12 foot length			Requalify each 5 years
Coefficient of thermal expansion	4.4.4 4.4.4.1	3	2 to 4 foot length			
Temperature limits	4.4.6	3	5 to 12 foot length			
Weight	4.4.7	3	2 foot length			
Concentricity	4.4.8	3	3 Sectioned pieces	4.4.8.1	3	Requalify each 5 years
Straightness				4.4.9	Visual inspect 100%. Sample measure all lots	
Identification of product				4.5	100% of all lots	

1/ When qualification testing has been successfully accomplished on one type and class of cable, only sampling qualification testing is required on the type and class not previously tested.

2/ Qualification test data for two different size cables shall be submitted, for consideration, to the Government agency responsible for qualification approval.

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Custodians:
Army - AV
Navy - AS
Air Force - 99

Review Activities:
Navy - SH

Preparing activity:
DLA-IS

(Project 4010-0226)

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.

2. The submitter of this form must complete blocks 4, 5, 6, and 7.

3. The preparing activity must provide a reply within 30 days from receipt of the form.

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I RECOMMEND A CHANGE:	**1. DOCUMENT NUMBER** MIL-DTL-87218A	**2. DOCUMENT DATE (YYMMDD)** 970815

CABLE, LOCKCLAD, FOR AIRCRAFT CONTROL

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME *(Last, First, Middle Initial)*	b. ORGANIZATION	
c. ADDRESS *(Include Zip Code)*	d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON *(if applicable)*	**7. DATE SUBMITTED** (YYMMDD)

8. PREPARING ACTIVITY

a. NAME DEFENSE INDUSTRIAL SUPPLY CENTER	b. TELEPHONE *Include Area Code)* (1) Commercial (2) AUTOVON
ATTN: DISC-EED 700 ROBBINS AVENUE PHILADELPHIA, PA 19111-5096	**IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:** DEFENSE QUALITY AND STANDARDIZATION OFFICE 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22401-3466 Telephone (703) 756-2340 AUTOVON 289-2340

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