FF-C-450D
March 6, 1973
SUPERSEDING
Fed. Spec. FF-C-450C
February 11, 1966

FEDERAL SPECIFICATION

CLAMPS, WIRE ROPE

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

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers clamps, wire rope, bolted, and clamps, wire rope, threaded. These clamps are also commercially known as clips, wire rope.

1.2 Classification.

1.2.1 Types and classes. Clamps shall be of the following types and classes (see 6.1).

Type I - Single grip, single saddle, with U-bolts and nuts (Fig. 1. Table V).

Class 1. Steel saddle (MS16842)
Class 2. Malleable-iron saddle

Type II - Double grip, double saddle, with U-bolt and nuts (Fig. 2, Table VI).

Type III - Double grip, double saddle, with bolts and nuts.

Class 1. Assembled with integrel L-shaped bolts and nuts (Fig. 3, Table VII) (MS51868)
Class 2. Assembled with separate hex headed bolts and nuts (Fig. 3a, Table VII) (MS51868)

Type IV - Double grip, two taper threaded half clamps with mating hexagon nut (Fig. 4, Table VII). (MS16843)

2. APPLICABLE DOCUMENTS

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

Federal Specifications:

NN-K-231 - Kegs: Wood, Slack.
QQ-I-666 - Iron Castings, Malleable.
QQ-P-416 - Plating, Cadmium (Electrodeposited).
QQ-Z-325 - Zinc Coating, Electrodeposited, Requirements for.
PPP-B-585 - Boxes, Wood, Wirebound.
PPP-B-591 - Boxes, Fiberboard, Woodcleated.
PPP-B-601 - Boxes, Wood, Cleated-Plywood.
PPP-B-621 - Boxes, Wood, Nailed and Lock-Corner.
PPP-B-636 - Box, Fiberboard.
PPP-B-640 - Boxes, Fiberboard, Corrugated, Triple-Wall.

Federal Standard:

Fed. Std. No. 123 - Marking for Domestic Shipment (Civil Agencies).

(Activities outside the Federal Government may obtain copies of Federal Specifications and Standards 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, U. S. Government Printing Office, Washington, DC 20402.

(Single copies of this specification and other product specifications required by activities outside the Federal Government for bidding purposes are available without charge 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 and Standards and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

Military Specifications:

MIL-P-116 - Preservation, Methods of.
MIL-I-6868 - Inspection Process, Magnetic Particles.
MIL-L-10547 - Liners, Case, and Sheet, Overwrap, Water-Vaporproof or Waterproof, Flexible.
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.
MIL-STD-130 - Identification Marking of U.S. Military Property.
MS16842 - Clamp, Wire Rope, Saddled, Single Grip, Steel.
MS16843 - Clamp, Wire Rope, (Double Grip), Threaded Steel.
MS51868 - Clamp, Wire Rope, Double Saddle, Double Grip, Steel.

(Copies of Military Specifications and Standards required by suppliers 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 a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

National Bureau of Standards (NBS) Handbook:

H28 - Screw-Thread Standards for Federal Services

(Application for copies should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402.)

American Standards Association (ANSI) Publication:

B18.2.2 - Square and Hex Nuts

(Application for copies should be addressed to American National Standards Institute, Inc., 1430 Broadway, New York, New York 10018.)

American Society for Testing and Materials (ASTM) Standard:

A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pa. 19103.)

Society of Automotive Engineers (SAE):

SAE J429 - Mechanical and Quality Requirements for Externally Threaded Fasteners

(Applications for copies should be addressed to the Society of Automotive Engineers (SAE) Standards Committee, 485 Lexington Avenue, New York, New York 10017.)

Uniform Classification Committee, Agent:

Uniform Freight Classification.

(Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago, Ill. 60606.)

National Motor Freight Traffic Association, Inc., Agent:

National Motor Freight Classification.

(Application for copies should be addressed to the American Trucking Association, Inc., Tariff Order Section, 1616 P St., N.W., Washington, DC 20036.)

3. REQUIREMENTS

3.1 Material.

3.1.1 Type I, Class 1 clamps (MS16842). Materials for saddles, bolts, and nuts shall be carbon steel, the properties of which shall withstand, without distortion, the torque test of 4.4.3. Saddles shall be made of steel forgings for wire rope sizes up through 2 inches inclusive; of steel castings for wire rope sizes larger than 2 inches.

3.1.2 Type I, Class 2 clamps. Material for bolts and nuts shall be carbon steel, the properties of which shall withstand, without distortion, the torque test of 4.4.3. Saddles shall be made of malleable iron, grade II (32510), in accordance with QQ-I-666.

3.1.3 Type II clamps. Material for bolts, saddles, and nuts shall be carbon steel the properties of which shall withstand, without distortion, the torque test of 4.4.3. Saddles shall be made of forged steel.

3.1.4 Type III clamps (MS51868). Material for Class 1 clamps and Class 2 saddles and nuts shall be carbon steel. Class 2 bolts shall be SAE J429, grade 5 steel or better. The properties of all type III clamps shall withstand, without distortion, the torque test of 4.4.3. Class 1 saddles with integral L-shaped bolts and Class 2 saddles shall be forged.

3.1.5 Type IV clamps (MS16843). Material for Type IV clamp bodies shall be of forged steel 1035 to 1040. The mating hexagon nut shall also be made of 1035 to 1040 steel.

3.2 BOLTS

3.2.1 Bolt threads. Thread series of bolts after hot dip zinc (galvanized) coating, electrodeposited zinc coating, or electrodeposited cadmium plating shall be Unified Coarse (UNC) Class 2A in accordance with Handbook H28.

3.2.2 Thread methods. Bolt threads may be rolled or cut at the option of the manufacturer. Threads shall not be recut or rerolled after hot dip zinc (galvanized) coating, electrodeposited zinc coating, or electrodeposited cadmium plating.

3.3 NUTS

3.3.1 Nut threads. Nut threads shall be of the same series and class as the bolts on which they are to be used (see 3.2.1). Threads shall not be recut after hot dip zinc (galvanized) coating, electrodeposited zinc coating, or electrodeposited cadmium plating.

3.3.2 Type. Nuts for Types I, II, and III clamps shall be heavy, hexagon, unfinished or semifinished in accordance with ANSI-B18.2.2 except nuts for Type I, Class 2 (malleable iron) saddles shall conform to the hexagon, regular or finished nut of ANSI B18.2.2.

3.4 Dimensions. Dimensions and weights of wire rope clamps shall conform to Tables V through VIII, as applicable, and as otherwise specified herein. Dimensional symbols are identified in Figures 1 through 4. Clamp sizes (Table V through Table VIII) are designated by the diameter of the wire rope with which they are used.

3.5 CONSTRUCTION

3.5.1 Configuration. Configuration details of clamp components may be to the contractor's design; however, the clamps assembled shall be representative of the illustrations in Figures 1 through 4, and shall conform to the applicable description of this specification (see 6.2).

3.5.1.1 Type I clamps. Type I clamps shall conform to Figure 1 and Table V. The inside width between the parallel U-bolts legs shall be at least 1/16 inch greater than the nominal wire rope diameter for size one inch and under and 1/8 inch greater for sizes over one inch. The thread length on U-bolt legs shall be sufficient to permit properly gripping a rope doubled over.

3.5.1.1.1 Saddles (Type I). Saddles for Classes 1 and 2 of Type I clamps shall have a semicircular path running in the longitudinal direction of the rope, sided by two wings on each side of the path for guiding the U-bolt and nesting the wire rope. The rope path shall have corrugations to accommodate a rope having a right-hand helix. The two holes for the U-bolt legs shall be dimensioned and spaced to fit the legs without binding.

3.5.1.2 Type II clamps. Type II clamps shall conform to Figure 2 and to Table VI. The width between the parallel U-bolt legs with saddles assembled shall accommodate the applicable wire rope. The thread length on the U-bolt legs shall be sufficient to permit the saddles to grip two ropes between saddles with nuts fully engaged.

3.5.1.2.1 Saddles (Type II). The "loop" saddle for Type II clamps, which in the assembly is slipped between the U-bolt legs, shall be formed with outside grooves and two top ridges for centering and holding it inside the U-bolt loop. The "clamping" saddle shall be of a rectangular shape with taper ends and shall have the eyes dimensioned and spaced to fit the U-bolt legs without binding. The "loop" and "clamping" saddles shall be grooved for nesting the wire rope. These grooves shall be made with corrugations running in the direction of the rope strands of a rope having a right hand helix and they shall be formed to give the maximum grip in the longitudinal direction with the rope remaining straight.

3.5.1.3 Type III clamps. Type III clamps shall be in accordance with Figure 3, Figure 3a, and Table VII. The width between the bolts of the assembled clamp shall accommodate the applicable wire rope. The clamps shall have the eyes so dimensioned and spaced that the halves assemble without binding.

3.5.1.3.1 Bolts and saddles (Type III). The L-shaped bolt with integral clamp saddle for Class 1 clamps shall be in conformance with the configuration of Figure 3. The saddle and bolt assembly for Class 2 clamps shall be in conformance with the configuration of Figure 3a. Saddles of both classes shall be grooved for nesting the wire rope. These grooves shall be made to run in the direction of the rope strands having a right-hand helix and they shall be formed to give the maximum grip in the longitudinal direction with the rope remaining straight. The thread length on the bolt section shall be sufficient to permit the saddles to grip two ropes between saddles with nuts fully engaged.

3.5.1.4 Type IV clamps. Type IV clamps shall be in accordance with Figure 4 and Table VIII. The threads of the component half clamps and nut shall be tapered and be in alignment when assembled. Each half clamp shall have the inside channel either cross corrugated or helically grooved for nesting the wire rope. Helical grooves shall run in the direction of the strands of a rope having a right-hand lay, unless a left-hand lay is specified (see 6.2). The nuts shall have no visible evidence of cracks and when specified (see 6.2) shall be capable of passing the magnetic particle test of 4.4.4.1.

3.5.2 Assembly. Clamps of the same size, type, and class, with the exception of Type IV, shall assemble readily with random selection of component parts. Type IV half clamps are made in matching pairs and parts are not interchangeable.

3.5.3 Identification marking. Clamps shall be legibly and permanently marked with size and the manufacturer's identifying mark in accordance with MIL-STD-130.

3.5.4 Protective finish. Unless otherwise specified in the contract or order, wire rope clamps shall receive a hot-dip zinc (galvanized) coating

in accordance with ASTM A153. Under conditions permitting or prescribing their use, electrodeposited zinc coating, Type II, Class 3 of QQ-Z-325 or cadmium plating, Type II, Class 3 of QQ-P-416 may be used (see 6.2).

3.5.5 Workmanship. All component parts of clamps shall be free of defects such as burrs, fins, sharp edges, cracks, flaws, corrosion, and malformations. Threads and corrugations shall be clean and properly formed. Coating, as specified (see 3.5.4), shall be adherent and shall cover all surfaces uniformly.

3.6 PERFORMANCE

3.6.1 Type I, II and III clamps. Types I, II, and III clamps shall be capable of passing the tests specified in 4.4.3.1.

3.6.2 Type IV clamps. The clamp grip shall be not less than 90 percent of its applicable wire rope rated breaking strength for sizes 1/4 inch and under and not less than 85 percent for sizes over 1/4 inch. Nuts for Type IV clamps shall be capable of passing the magnetic particle test of 4.4.4.1 when such test is required in the contract or order (see 6.2).

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 Test equipment and inspection facilities. The contractor shall establish and maintain a calibration system in accordance with MIL-C-45662.

4.2 SAMPLING

4.2.1 Inspection lot. An inspection lot shall consist of clamps of the same type, class, material, protective coating, thread series, and size produced under essentially the same conditions and presented for acceptance at the same time.

4.2.2 Sampling for examination of clamps. A random sample of clamps shall be taken from each lot in accordance with MIL-STD-105 at inspection level II. The acceptable quality level (AQL) shall be as specified in Table I.

4.2.3 Sampling for protective finish tests. Sampling for tests of protective finishes shall be in accordance with the applicable specifications of 3.5.4.

4.2.4 Sampling for packaging tests. A random sample of unit packages for packaging tests shall be as specified in MIL-P-116.

4.2.4.1 Sampling for examination of packaging, packing, and marking. Samples for examination shall be selected at random from each inspection lot in accordance with procedures prescribed in MIL-STD-105 for inspection level II. The Acceptable Quality Level (AQL) shall be as specified in Table II.

4.2.5 Sampling for torque test. A random sample of types I, II and III clamps, as applicable, shall be taken from each lot in accordance with MIL-STD-105 at inspection level S-4. The AQL shall be 4.0 percent defective.

4.2.6 Sampling of type IV nuts for magnetic particle inspection. When magnetic particle inspection is specified in the contract or order, a random sample of Type IV nuts shall be taken from each lot in accordance with MIL-STD-105 at inspection level S-4. The AQL shall be 1.0 percent defective.

4.3 EXAMINATION

4.3.1 Visual and dimensional inspection. Each clamp taken as specified in 4.2.2 shall be examined to verify compliance with this specification. Examination shall be conducted in accordance with Table I. Any clamp in the sample containing one or more defects shall be rejected and if the number of defective clamps exceeds the acceptance number for the sample, the lot represented by the sample shall be rejected.

TABLE I. Classification of defects for examination of assembled clamps

Categories	Defects	Inspection Method
Critical	None defined	
Major:	AQL = 2.5 percent	
101	Defective threads (3.2.1 and 3.3.1)	Gage
102	Nonconformity of dimensions (3.4)	Visual
103	Nonconformity of thread length (assembly)	Visual
104	Improper configuration of components (see applicable figure)	Visual
105	Protective finish not as specified (see 4.4.1 for tests of protective finishes)	Visual
Minor:	AQL = 6.5 percent	
201	Illegible or improper marking (3.5.3)	Visual
202	Workmanship (3.5.5)	Visual

4.3.2 Packaging, packing and marking. Each random sample unit of 4.2.4.1 shall be examined for all the characteristics of Table II.

TABLE II. Classification of defects for packaging, packing, and marking

Categories	Defects	Inspection Method
Critical	None defined	
Major:	AQL = 1.0 percent	
101	Illegible marking	Visual
102	Incorrect marking	Visual
Minor:	AQL = 2.5 percent	
201	Improper closure of interior package	Visual
202	Nonadherence to prescribed preservative	Visual
203	Nonadherence to prescribed package materials	Visual
204	Nonadherence to shipping container specification	Visual

4.4 Test producedures.

4.4.1 Protective coating test. Test of protective coating shall be conducted in accordance with the applicable specifications of 3.5.4.

4.4.2 Packaging tests. Tests for unit packages selected in accordance with 4.2.4 shall be conducted as prescribed in MIL-P-116 for the applicable packaging method, except that the rough handling test will not be required.

4.4.3 Torque test of types I, II, and III clamps. Unless otherwise stated in contract or order, each sample of 4.2.5 shall be tested by the contractor as follows:

4.4.3.1 Test method. Two steel rods, of the same diameter as the wire rope for which the clamp is intended, shall be inserted in the clamp opening (see Fig 5). The clamp nuts shall be tightened with a torque wrench to the applicable torque values given in Table III. Tightening shall be accomplished progressively by applying torque alternately to each nut in increments of ten percent of the maximum torque values for the size clamp being tested. The maximum torque on each nut shall be held for ten minutes. After the ten minute period, clamps shall be disassembled and visually examined for distortion, then tested by being reassembled and disassembled by hand without tools. Clamps unable to perform this test shall be considered defective. This torque test does not apply to Type IV clamps.

TABLE III. Torque values for torque testing only*
(Applies to wire rope clamp nuts)

Nominal Clamp Size Wire Rope	NUT TORQUE				
	Type I		Type II	Type III	
	Class 1	Class 2		Class 1	Class 2
1/8	34 in-lbs		34 in-lbs	34 in-lbs	
3/16	66 in-lbs	32 in-lbs	78 in-lbs	78 in-lbs	14 ft-lbs
1/4	12 ft-lbs	12 ft-lbs	144 in-lbs	144 in-lbs	24 ft-lbs
5/16	18.5 ft-lbs	12 ft-lbs	222 in-lbs	222 in-lbs	40 ft-lbs
3/8	25 ft-lbs	18.5 ft-lbs	25 ft-lbs	25 ft-lbs	66 ft-lbs
7/16	35 ft-lbs	18.5 ft-lbs	35 ft-lbs	35 ft-lbs	100 ft-lbs
1/2	35 ft-lbs	25 ft-lbs	43 ft-lbs	43 ft-lbs	100 ft-lbs
9/16	50 ft-lbs	35 ft-lbs	50 ft-lbs	50 ft-lbs	146 ft-lbs
5/8	50 ft-lbs	35 ft-lbs	75 ft-lbs	75 ft-lbs	146 ft-lbs
3/4	100 ft-lbs	50 ft-lbs	100 ft-lbs	100 ft-lbs	200 ft-lbs
7/8	140 ft-lbs	100 ft-lbs	140 ft-lbs	140 ft-lbs	335 ft-lbs
1	140 ft-lbs	100 ft-lbs	190 ft-lbs	190 ft-lbs	335 ft-lbs
1-1/8	140 ft-lbs	140 ft-lbs	220 ft-lbs	220 ft-lbs	335 ft-lbs
1-1/4	275 ft-lbs	140 ft-lbs	275 ft-lbs	275 ft-lbs	500 ft-lbs
1-3/8	275 ft-lbs	275 ft-lbs	340 ft-lbs	340 ft-lbs	500 ft-lbs
1-1/2	275 ft-lbs	275 ft-lbs	420 ft-lbs	420 ft-lbs	775 ft-lbs
1-5/8	420 ft-lbs		480 ft-lbs	480 ft-lbs	
1-3/4	590 ft-lbs		590 ft-lbs	590 ft-lbs	
2	750 ft-lbs		750 ft-lbs	750 ft-lbs	
2-1/4	750 ft-lbs		820 ft-lbs	820 ft-lbs	
2-1/2	750 ft-lbs		1150 ft-lbs	1150 ft-lbs	
2-3/4	750 ft-lbs		1450 ft-lbs	1450 ft-lbs	
3	1200 ft-lbs		1650 ft-lbs	1650 ft-lbs	

* Not to be used for application nut torque values.

4.4.4 Test of type IV clamps. The contractor shall furnish an Underwriter's Laboratories, Inc. approved test report. When this listing is not available, the contractor shall submit proof that the clamp grip conforms to 3.6.2.

4.4.4.1 Magnetic particle test of type IV nuts. When specified in the contract or order, type IV nuts shall be examined and tested in accordance with MIL-I-6868 (see 6.2).

4.4.5 Malleable-iron test. When malleable-iron saddles (Type I, Class 2 clamps) are specified, the contractor shall furnish, prior to production, a test report by a laboratory acceptable to the Government that the malleable-iron employed for saddles meets the requirements of 3.1.2. In lieu of such report, the contractor shall carry out necessary tests of the iron under Government surveillance to show conformance with 3.1.2.

5. PREPARATION FOR DELIVERY

5.1 Preservation and packaging. Preservation and packaging shall be level A or C as specified (see 6.2).

5.1.1 Level A.

5.1.1.1 Cleaning. All clamps shall be cleaned in accordance with process C-1 of MIL-P-116.

5.1.1.2 Drying. All clamps shall be dried in accordance with process D-1, D-2 or D-3 of MIL-P-116.

5.1.1.3 Preservation. Not applicable.

5.1.1.4 Unit Packaging. Unless otherwise specified (see 6.2) all clamps shall be packaged in unit quantities specified in Table IV. Unit containers shall conform to Grade W5C of PPP-B-636. The gross weight of the container shall not exceed the weight limitations of the specification. Items in Table IV marked with an asterisk shall be bulk packed as specified in 5.2.

5.1.2 Level C.

5.1.2.1 Cleaning, drying and preservation shall be the same as specified for level A (See 5.1.1).

5.1.2.2 Unit Packaging.

5.1.2.2.1 Military requirements. Unit packaging shall be the same as specified for level A (see 5.1.1.4) except the unit container shall conform to class domestic of PPP-B-636.

5.1.2.2.2 Civil agencies. Clamps shall be packaged in accordance with manufacturer's commercial practices and shall afford adequate protection against corrosion, deterioration and physical damage.

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

5.2.1 Level A. Clamps unit packaged in accordance with 5.1.1.4 shall be packed in fiberboard or wood containers conforming to class weather resistant of PPP-B-636, PPP-B-640, Class 2 of PPP-B-621 or overseas type of PPP-B-601. When specified, PPP-B-621 and PPP-B-601 shall have case liners conforming to MIL-L-10547 which shall be closed and sealed in accordance to the appendix thereto. Closure for fiberboard and wood containers shall be in accordance with the appendix to the applicable

specification. The gross weight of PPP-B-636 containers shall not exceed the weight limitations of the specification. The gross weight of PPP-B-640, PPP-B-621 and PPP-B-601 boxes shall not exceed 200 pounds.

5.2.1.1 Bulk items shall be packed in containers conforming to overseas type of PPP-B-601, Class 2 of PPP-B-621, Class 2 of PPP-B-640 or NN-K-231. Gross weight of the containers shall not exceed 200 pounds.

5.2.2 Level B. Clamps unit packaged in accordance with level A (see 5.1.1.4) shall be packed in fiberboard or wood containers conforming to class domestic of PPP-B-636, PPP-B-640, Class 1 of PPP-B-591, Class 1 of PPP-B-585, Domestic type of PPP-B-601, or Class 1 of PPP-B-621. Closure of the containers shall be in accordance with the appendix to the applicable specification. Gross weight of PPP-B-636 containers shall not exceed the weight limitations of the specification. Gross weight of all other listed containers shall not exceed 200 pounds.

5.2.2.1 Bulk items shall be packed in containers conforming to domestic type of PPP-B-601, Class 1 of PPP-B-621, Class 1 of PPP-B-640 or NN-K-231. Gross weight of the containers shall not exceed 200 pounds.

5.2.3 Level C. When specified (see 6.2).

5.2.3.1 Military requirements. Level C requirements shall be the same as specified for Level B (see 5.2.2).

5.2.3.2 Civil Agencies. Unit packages or bulk items shall be packed in accordance with manufacturer's commercial practices to provide protection against corrosion, deterioration and physical damage from supply source to receiving activity for immediate use. Containers shall comply with applicable Uniform Freight Classification rules or National Motor Freight Classification rules.

5.4 Marking.

5.4.1 Military requirements. Unit packages and exterior shipping containers shall be marked in accordance with the requirements of MIL-STD-129.

5.4.2 Civil agencies. Unit packages and exterior shipping containers shall be marked in accordance with the requirements of Fed. Std. No. 123.

TABLE IV. Quantity per unit package

Clamp Size	Type I	Type II	Type III	Type IV
1/16				100
1/8	100			100
3/16	100	100	100	100
1/4	100	100	100	100
5/16	100	100	100	50
3/8	100	100	100	50
7/16	50	50	50	25
1/2	50	50	50	10
9/16	25	25	25	-
5/8	25	25	25	10
3/4	25	25	25	4
7/8	10	10	10	-
1	10	10	10	-
1-1/8	10	10	10	-
1-1/4	4	10	10	-
1-3/8	4	4	4	-
1-1/2	4	4	4	-
1-5/8	4	-	-	-
1-3/4	4	*	-	-
2	*	*	-	-
2-1/4	*	-	-	-
2-1/2	*	-	-	-
2-3/4	*	-	-	-
3	*	-	-	-

* Items shall be bulk packed in quantities not exceeding weight limitations imposed by 5.2.1.1.

6. NOTES

6.1 Intended use.

6.1.1 Type I, II and III clamps, bolted. Types I, II and III wire rope clamps are intended for use on wire rope eye-loop connections or complete-loop, end-to-end connections where socketing or splicing is not feasible when a nonpermanent or temporary joint is required. The clamps also may be used in an end-to-end connection to make a continuous length wire rope, but in emergency cases only.

6.1.2 Single-saddle clamps. Single-saddle wire rope clamps, Type I, may be used interchangeably with double-saddle wire rope clamps, Type II and Type III, Class 1, on wire ropes of the same diameter but should

not be used interchangeably with Type III, Class 2 clamps. Single-saddle wire rope clamps should be placed on eye-loop connections with their U-bolts on the dead or short end of the rope.

6.1.3 Positioning of components. Wire rope clamps should be placed on the wire rope connection with the corrugations in their saddles coinciding with the lay of the wire rope. The nuts on the clamps should be retightened immediately after the initial loading, and at frequent intervals of time thereafter. For the recommended number of Type I, Class 1 clamps, see MS16842, for Type III, Class 1 or Class 2 clamps, see MS51868.

6.1.4 Type IV clamps, threaded. Type IV wire rope clamps consist of a split, taper thread body and mating hexagonal nut and are intended for use on wire rope eye-loops.

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.
(b) Type, class, size, and quantity of each.
(c) Lay, if left handed (see 3.5.1.4).
(d) Protective finish requirements if other than hot dip galvanized (see 3.5.4).
(e) Design sample, if required (see 3.5.1).
(f) Packaging requirements (nonmilitary or military and level of packaging required).
(g) Case liners if required (see 5.2.1).
(h) Exception to quantity in unit package of Table IV (5.1.1.4).
(i) Magnetic particle inspection, if required (see 4.4.4.1).

6.3 Military procurement. Personnel within the Military Departments shall refer to MS16842 for Type I, Class 1 clamps, MS51868 for Type III, Class 1 and Class 2 clamps, and MS16843 for Type IV clamps.

6.4 Item name. Defined in accordance with the approved item name in Cataloging Handbook Hy-1, "Clamps, wire rope, bolted" and "Clamps, wire rope, threaded" covered by this specification are also identified as "Clips, wire rope" by manufacturers and commercial users.

TABLE V. Dimensional and weight requirements for Style I, single grip, wire rope clamps

Clamp Size	TYPE I					
	Class 1			Class 2		
	Thread D Minimum	L Minimum	Weight Minimum	Thread D Minimum	L Minimum	Weight Minimum
inches	inches	inches	pounds	inches	inches	pounds
1/8	12-24	.719	.05			
3/16	1/4-20	.938	.09	10-24	.875	.06
1/4	5/16-18	1.031	.18	5/16-18	1.188	.13
5/16	3/8-16	1.313	.25	5/16-18	1.188	.15
3/8	7/16-14	1.500	.42	3/8-16	1.563	.21
7/16	1/2-13	1.875	.70	3/8-16	1.625	.24
1/2	1/2-13	1.875	.73	7/16-14	2.000	.37
9/16	9/16-12	2.250	.80	1/2-13	2.125	.54
5/8	9/16-12	2.375	.90	1/2-13	2.313	.59
3/4	5/8-11	2.750	1.50	9/16-12	2.563	.83
7/8	3/4-10	3.125	2.00	5/8-11	3.063	1.25
1	3/4-10	3.500	2.50	5/8-11	3.375	1.50
1-1/8	3/4-10	3.875	3.10	3/4-10	3.875	2.42
1-1/4	7/8-9	4.250	4.60	3/4-10	3.875	2.60
1-3/8	7/8-9	4.625	5.20			
1-1/2	7/8-9	4.938	5.90	7/8-9	4.500	5.00
1-5/8	1 -8	5.313	7.30			
1-3/4	1-1/8-7	5.750	9.80			
2	1-1/4-7	6.438	13.40			
2-1/4	1-1/4-7	7.125	15.70			
2-1/2	1-1/4-7	7.688	17.90			
2-3/4	1-1/4-7	8.313	22.00			
3	1-1/2-6	9.188	32.00			

TABLE VI. Dimensional and weight requirements for type II, double grip, wire rope clamps.

TYPE II			
Clamp Size	Thread D Minimum	L Minimum	Weight Minimum
inches	inches	inches	pounds
3/16	5/16-18	1.125	.30
1/4	3/8-16	1.313	.32
5/16	3/8-16	1.500	.44
3/8	1/2-13	1.750	.65
7/16	1/2-13	1.875	.79
1/2	1/2-13	2.188	.80
9/16	5/8-11	2.438	1.28
5/8	5/8-11	2.750	1.38
3/4	5/8-11	3.000	1.85
7/8	3/4-10	3.375	2.75
1	3/4-10	3.625	3.15
1-1/8	3/4-10	4.000	3.80
1-1/4	7/8-9	4.375	5.24
1-3/8	7/8-9	4.625	5.58
1-1/2	1 -8	5.125	7.44
1-3/4	1-1/8-7	6.000	10.02
2	1-1/4-7	6.000	13.00

TABLE VII. Dimensional and weight requirements for Type III, double grip, wire rope clamps

TYPE III				
Clamp Size	Classes 1 and 2			Class 1
	Thread D Minimum	L Minimum	W Width Minimum	Weight Minimum
inches	inches	inches	inches	weight
3/16	10-24	1.281	.938	.21
1/4	1/4-20	1.281	.938	.21
5/16	1/4-20	1.438	1.062	.26
3/8	5/16-18	1.688	1.062	.37
7/16	7/16-14	2.125	1.188	.48
1/2	7/16-14	2.125	1.250	.60
9/16	1/2-13	2.688	1.375	1.08
5/8	1/2-13	2.688	1.500	1.08
3/4	1/2-13	2.812	1.750	1.34
7/8	9/16-12	3.250	2.125	2.20
1	3/4-10	3.562	2.250	2.68
1-1/8	3/4-10	4.000	2.312	2.96
1-1/4	3/4-10	4.250	2.500	4.03
1-3/8	7/8-9	5.438	2.750	6.58
1-1/2	1 -8	5.438	3.000	6.58

TABLE VIII. Dimensional, thread, and weight requirements for Type IV, double grip, wire rope clamps

TYPE IV						
Clamp Size	W ± .015	P ± .015	D ± .015	L ± .015	Weight	Threads
inch	inch	inches	inches	inches	pounds	per inch
1/16	.188	.688	.625	.766	.08	20
1/8	.188	.688	.625	.766	.08	20
3/16	.219	.875	.812	1.000	.22	20
1/4	.250	1.031	1.000	1.125	.31	16
5/16	.313	1.219	1.250	1.375	.62	16
3/8	.375	1.406	1.375	1.562	.81	16
7/16	.438	1.625	1.625	1.812	1.06	12
1/2	.500	1.875	1.875	2.125	2.00	12
5/8	.750	2.188	2.250	2.375	3.00	10
3/4	.875	2.625	2.625	3.000	5.25	10

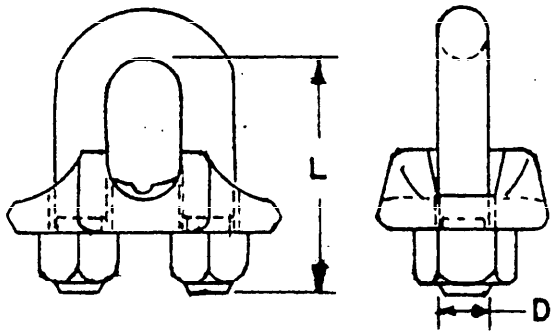

Figure 1. Type I, single grip, single saddle wire rope clamp (one single saddle with U-bolt).

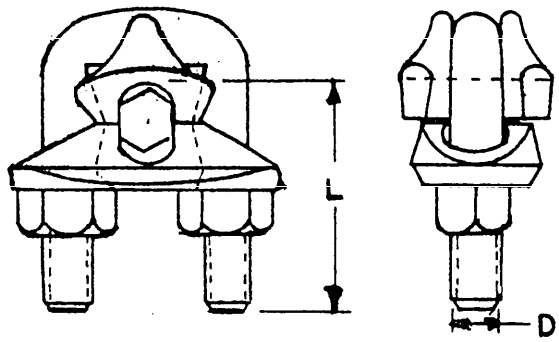

Figure 2. Type II, double grip, double saddle wire rope clamp (two separate saddles with U-bolt).

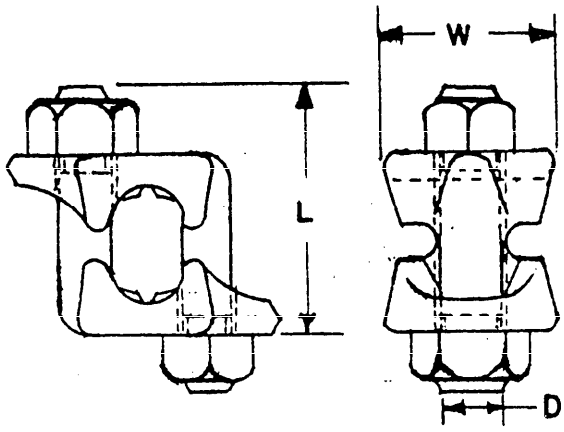

Figure 3. Type III, Class 1, double grip, double saddle wire rope clamp (saddles integral with two L-shaped clamps).

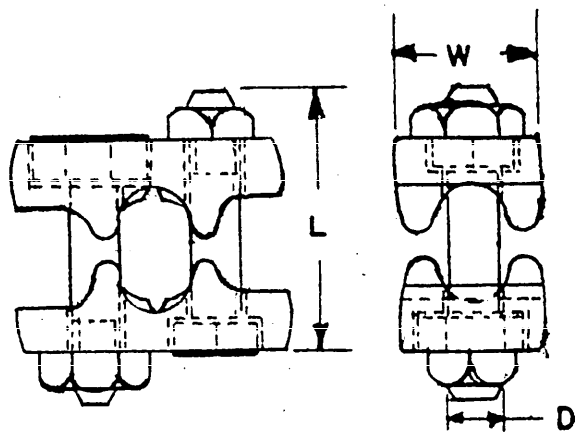

Figure 3a. Type III, Class 2, double grip, double saddle wire rope clamp (assembled with separate hex head bolts and nuts).

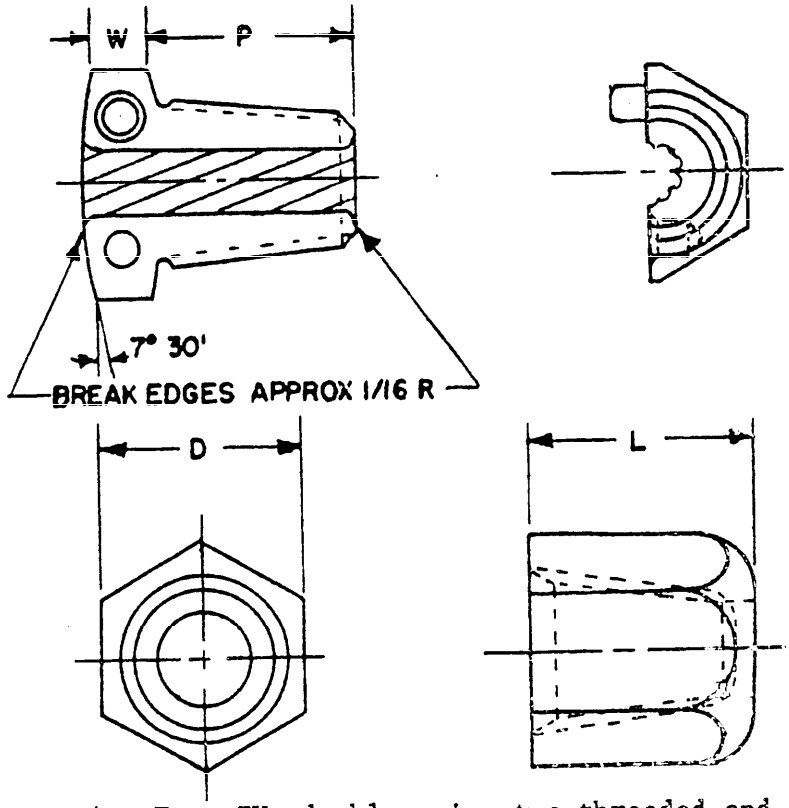

Figure 4. Type IV, double grip, two threaded and tapered half-clamps with mating hexagon nut.

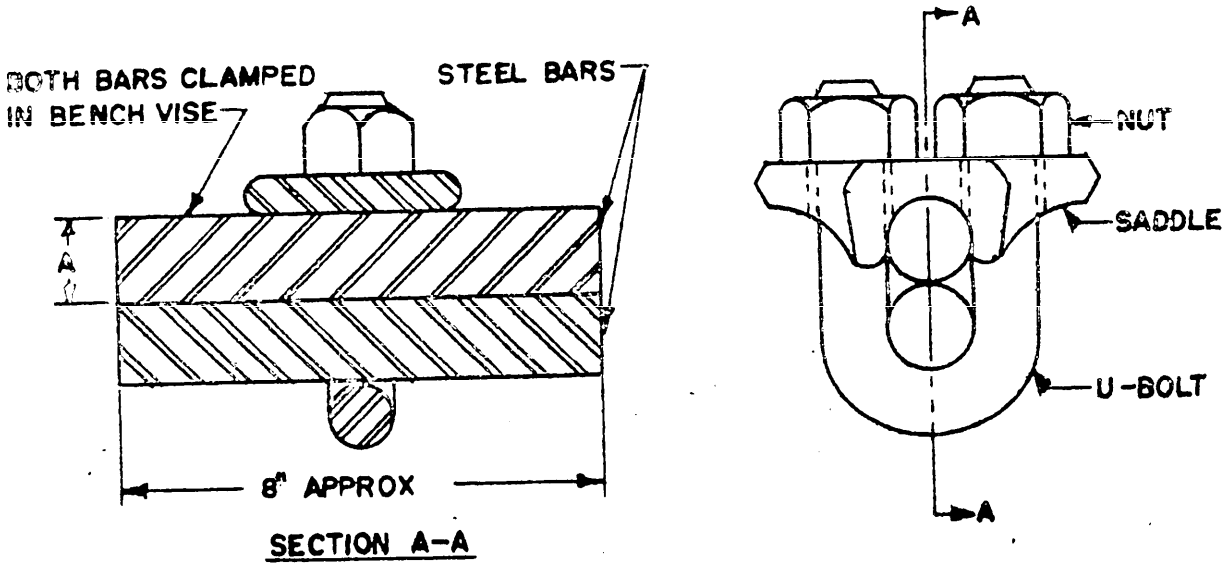

Figure 5. Arrangement for tightening wire rope clamps over steel bars.

MILITARY CUSTODIANS:

Army - WC
Navy - SH
Air Force - 82

Review activities:

Army - EL, ME, GL
Navy - YD
Air Force - None

User activities:

Army - AV, AT
Navy - MC
Air Force - None

Preparing activity:

Army - WC

Civil Agency Coordinating Activity:

GSA -FSS

Project No. 4030-0135

Orders for this publication are to be placed with the General Services Administration, acting as an agent for the Superintendent of Documents. See section 2 of this specification to obtain extra copies and other documents referenced herein. Price 20 cents each.

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE

3a. NAME OF SUBMITTING ORGANIZATION	4. TYPE OF ORGANIZATION *(Mark one)*
	☐ VENDOR ☐ USER ☐ MANUFACTURER ☐ OTHER *(Specify)*:
b. ADDRESS *(Street, City, State, ZIP Code)*	

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional	b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional
c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional	8. DATE OF SUBMISSION *(YYMMDD)*

DD FORM 1426 82 MAR

PREVIOUS EDITION IS OBSOLETE.

(TO DETACH THIS SHEET, CUT ALONG THIS LINE.)

INSTRUCTIONS: In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge *(DO NOT STAPLE)*, and mailed. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

NOTE: This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document*(s)* or to amend contractual requirements.

(Fold along this line)

(Fold along this line)

DEPARTMENT OF THE ARMY

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 12062 WASHINGTON D. C.

POSTAGE WILL BE PAID BY THE DEPARTMENT OF THE ARMY

Commander
Rock Island Arsenal
Weapons Laboratory
Attn: SWERR-E-SC
Rock Island, Illinois 61201