

FF-S-760a

April 30, 1964

SUPERSEDING

Int. Fed. Spec. FF-S-00760

March 1, 1963

FEDERAL SPECIFICATION

STRAP, RETAINING, (METAL FOR CONDUIT,
PIPE, AND CABLE)

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

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers one-hole and two-hole metal retaining straps for conduit, pipe, and cable.

1.2 Classification.

1.2.1 Types and styles. Retaining straps shall be of the following types and styles, as specified (see 6.2):

Type I.—One-hole strap.

Style A—Malleable iron or steel.

Style B—Cold rolled or forged steel.

Type II.—Two-hole strap.

Style A—Steel.

Type III.—Two-hole strap.

Style A—Steel.

Style B—Aluminum.

1.2.2 Sizes. Unless otherwise specified (6.2), retaining straps shall be furnished in the sizes in accordance with tables I to IV, inclusive.

2. APPLICABLE SPECIFICATIONS
AND STANDARDS

2.1 The following specifications and standards, of the issues in effect on date of invitation for bids, form a part of this specification to the extent specified herein:

Federal Specifications:

QQ-A-250/5—Aluminum Alloy Alclad 2024, Plate and Sheet.

QQ-I-666—Iron Castings, Malleable.

QQ-P-416—Plating, Cadmium, (Electrodeposited).

QQ-S-698—Steel, Sheet and Strip, Low-Carbon.

QQ-Z-325—Zinc Coating, Electrodeposited, Requirements For.

PPP-B-566—Boxes, Folding, Paperboard.

PPP-B-601—Boxes, Wood, Cleated-Plywood.

PPP-B-621—Boxes, Wood, Nailed and Lock-Corner.

PPP-B-636—Box, Fiberboard.

PPP-B-665—Boxes, Paperboard, Metal Stayed (Including Stay Material).

PPP-B-676—Boxes, Set-up, Paperboard.

Federal Standards:

Fed. Std. No. 102—Preservation, Packaging and Packing Levels.

Fed. Std. No. 123—Marking for Domestic Shipment (Civilian Agencies).

Fed. Test Method Std. No. 151—Metals; Test Methods.

(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, U. S. Government Printing Office, Washington, D. C. 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, D. C., Atlanta, Chicago, Kansas City, Mo., Dallas, Denver, San Francisco, Los Angeles, and Seattle, Wash.

(Federal Government activities may obtain copies of Federal Specifications, Standards, and Hand-

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books and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

Military Specification:

MIL-S-13048 — Steel, Forging, For General Purpose Use.

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 suppliers in connection with specific procurement functions should be obtained from the procuring activity as directed by the contracting officer.)

3. REQUIREMENTS**3.1 Materials.****3.1.1 Type I.**

3.1.1.1 *Style A.* Straps shall be of malleable iron conforming to QQ-I-666, grade IG, or shall be of forged steel in accordance with MIL-S-13048.

TABLE I.—Type I, style A, dimensional requirements

Size, inches		Figure 1, dimensions, inches						
Pipe or Conduit	Cable OD	A ¹	B ²	C ³	D ⁴	E ⁵	Hole size ⁶	T ⁷
	3/16	3/16	.187	5/8	11/32	7/8	7/32	
	1/4	1/4	.250		1/2	15/16		
	5/16	5/16	.312			1		
	3/8	3/8	.375		37/64	1- 1/8		
1/8	13/32	13/32	.405			1- 1/4		
1/4	17/32	17/32	.540		21/32	1- 5/16		
	9/16	9/16	.562		11/16			
	5/8	5/8	.625	11/16	3/4	1- 3/8	9/32	7/32
3/8	11/16	21/32	.675		27/32	1-13/16		
1/2	27/32	27/32	.840		15/16	2- 1/16		
	29/32	29/32	.922	3/4	1	2- 1/8		9/32
3/4	1- 1/16	1- 1/32	1.050		1- 1/16	2- 7/16		
	1- 1/8	1- 1/8	1.125		1- 1/4	2-11/16		11/32
1	1- 5/16	1- 5/16	1.315	7/8	1- 9/32	2- 3/4		5/16
	1- 1/2	1- 1/2	1.500		1- 5/8	3- 1/4		11/32
1-1/4	1-21/32	1-21/32	1.660		1-41/64	3- 3/8	11/32	
	1- 3/4	1- 3/4	1.750	1- 1/8	1-11/16	3-15/16	13/32	1/2
1-1/2	1-29/32	1-29/32	1.900		1-23/32	4	15/32	
2	2- 3/8	2- 3/8	2.375	1- 1/4	2- 1/4	5- 1/8		17/32
2-1/2	2- 7/8	2- 7/8	2.875	1- 5/8	2- 3/4	6- 7/16	9/16	23/32
3	3- 1/2	3- 1/2	3.500	1- 3/4	3- 1/16	7- 1/8		25/32
3-1/2	4	4	4.000	1- 7/8	3- 1/2	8- 1/8	21/32	27/32
4	4- 1/2	4- 1/2	4.500	2	3- 3/4	8- 3/4		29/32
4-1/2	5	5	5.000	2- 1/8	4	9- 3/8		31/32
5	5- 5/8	5- 5/8	5.625	2- 1/4	4- 1/2	10- 7/16		1- 1/32

¹ Plus nothing, minus 0.062 inch

² Plus nothing, minus 0.062 inch for steel straps, and plus 0.062 inch, minus nothing for malleable iron straps

³ Plus or minus 0.125 inch

⁴ Plus or minus 0.062 inch

⁵ Plus or minus 0.125 inch

⁶ Plus 0.031 inch, minus 0.015 inch

⁷ Plus or minus 0.031 inch

TABLE II.—Type I, styles B, dimensional requirements

Size, inches		Figure 2, dimensions, inches						
Pipe or Conduit	Cable OD	A ¹	B ²	C ³	D ⁴	E ⁵	Hole size ⁶	T1 ⁷
	3/16	3/16	.187	5/8	11/23	7/8	7/32	1/16
	1/4	1/4	.250		1/2 ¹	15/16		
	5/16	5/16	.312			1		
	3/8	3/8	.375		37/64	1- 1/8		
1/8	13/32	13/32	.405			1- 1/4		
1/4	17/32	17/32	.540		21/32	1- 5/16		
	9/16	9/16	.562	11/16	11/16		9/32	5/64
	5/8	5/8	.625		3/4	1- 3/8		
3/8	11/16	21/32	.675		27/32	1-13/16		
1/2	27/32	27/32	.840		15/16	2- 1/16		
	29/32	29/32	.922		1	2- 1/8		
3/4	1- 1/16	1- 1/32	1.050		1- 1/16	2- 7/16		
	1- 1/8	1- 1/8	1.125	7/8	1- 1/4	2-11/16	11/32	3/32
1	1- 5/16	1- 5/16	1.315		1- 9/32	2- 3/4		
	1- 1/2	1- 1/2	1.500		1- 5/8	3- 1/4		
1-1/4	1-21/32	1-21/32	1.660		1-41/64	3- 3/8		
	1- 3/4	1- 3/4	1.750		1-11/16	3-15/16		
1-1/2	1-29/32	1-29/32	1.900		1-23/32	4		
2	2- 3/8	2- 3/8	2.375	1- 1/4	2- 1/4	5- 1/8	15/32	
2-1/2	2- 7/8	2- 7/8	2.875	1- 5/8	2- 3/4	6- 7/16	9/16	
3	3- 1/2	3- 1/2	3.500	1- 3/4	3- 1/16	7- 1/8	21/32	
3-1/2	4	4	4.000	1- 7/8	3- 1/2	8- 1/8		
4	4- 1/2	4- 1/2	4.500	2-	3- 3/4	8- 3/4		
4-1/2	5	5	5.000	2- 1/8	4	9- 3/8		
5	5- 5/8	5- 5/8	5.625	2- 1/4	4- 1/2	10- 7/16		

¹ Plus nothing, minus 0.062 inch² Plus nothing, minus 0.062 inch³ Plus or minus 0.125 inch⁴ Plus or minus 0.062 inch⁵ Plus or minus 0.062 inch⁶ Plus 0.031 inch, minus 0.015⁷ Plus or minus 0.031 inch

3.1.1.2 *Style B.* Straps shall be of steel conforming to QQ-S-698, cold rolled, No. 2 or No. 3 tempers, or shall be of forged steel in accordance with MIL-S-13048.

3.1.2 *Type II, style A.* Straps shall be of steel conforming to QQ-S-698, cold rolled, No. 2, 3, 4, or 5 temper.

3.1.3 *Type III.*

3.1.3.1 *Style A.* Straps shall be of steel conforming to QQ-S-698, cold rolled, No. 2, 3, 4, or 5 temper.

3.1.3.2 *Style B.* Straps shall be of aluminum alloy conforming to QQ-A-250/5.

3.2 Design.

3.2.1 *Type I.*

3.2.1.1 *Style A.* Straps shall be similar to figure 1 and shall conform to table I.

3.2.1.2 *Style B.* Straps shall be similar to figure 2 and shall conform to table II.

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TABLE III.—Type II, style A, dimensional requirements

Size, inches		Figure 3, dimensions, inches									
Pipe or Conduit	Cable OD	A ¹	B ²	C ³	D ⁴	E ⁵	F ⁶	G ⁷	R ⁸		
1/8	13/32	.406	.203	.500	.219	.203	1.750	.048	.375		
1/4	17/32	.540	.270			.219	2.000				
	9-1/16	.562	.281								
	5/8	.625	.312								
3/8	11/16	.688	.344	.625	.375	.281	2.375	.063	.500		
	3/4	.750	.375	.688			2.500				
1/2	27/32	.844	.422	.750			2.625				
	1	1.000	.500				2.750	.080	.562		
3/4	1- 1/16	1.062	.531				2.875				
	1- 1/8	1.125	.562				3.000				
1	1- 5/16	1.315	.657	.875			.375	.281	3.125	.125	.625
	1- 1/2	1.500	.750						3.375		
1-1/4	1-21/32	1.660	.830						3.625		
	1- 3/4	1.750	.875						3.750		
1-1/2	1-29/32	1.906	.953	1.000	.500	.344	4.000	.750	.750		
2	2- 3/8	2.375	1.187				5.500				
2-1/2	2- 7/8	2.875	1.437				6.000				
3	3- 1/2	3.500	1.750				6.500				
3-1/2	4	4.00	2.00			.375	7.000				

¹ Plus or minus 0.010 inch² Plus or minus 0.010 inch³ Plus 0.125 inch, minus nothing⁴ Plus or minus 0.062 inch⁵ Plus 0.031 inch, minus 0.016 inch⁶ Plus or minus 0.125 inch⁷ Plus or minus 0.015 inch⁸ Plus or minus 0.125 inch

TABLE IV.—Type III, style A and style B, dimensional requirements

Size, inches		Figure 4, dimensions, inches	
Tube size		A ¹	B ²
1/8		.109	.062
3/16		.172	.094
1/4		.234	.125
5/16		.297	.156
3/8		.359	.188
7/16		.422	.219
1/2		.484	.250
9/16		.547	.281
5/8		.609	.312
11/16		.672	.344
3/4		.734	.375
13/16		.797	.406
7/8		.859	.438
15/16		.922	.469
1		.984	.500
1- 1/4		1.234	.625
1- 1/2		1.484	.750
1- 3/4		1.734	.875
2		1.984	1.000

3.2.2 Type II, style A. Straps shall be similar to figure 3 and shall conform to table III.

3.2.3 Type III, style A. Straps shall be similar to figure 4 and shall conform to table IV.

3.3 Protective finish.

3.3.1 Types I and II. All styles of these types shall be cadmium plated in conformance with QQ-P-416, type II, class 1, or zinc coated in accordance with QQ-Z-325, type II, class 2 (4.4.1 and 4.4.2).

3.3.2 Type III.

3.3.2.1 Style A. Straps shall be cadmium plated in accordance with QQ-P-416, type II, class 3 (4.4.2).

3.3.2.2 Style B. Straps shall be anodized, non-dyed or chemically treated.

3.4 Workmanship. Straps shall have no pits, rust, loose scale, chips, splits, cracks, burrs or other defects that affect serviceability.

4. SAMPLING, INSPECTION, AND TEST PROCEDURES

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

4.2 Sampling. The sample size levels of inspection shall be in accordance with MIL-STD-105.

4.2.1 Lot. Unless otherwise specified (6.2), a lot shall consist of all retaining straps of the same type, style, and size submitted for inspection at the same time.

4.2.2 Sampling for inspection of packaging and packing. Retaining straps packaged and packed ready for shipment shall be sampled in accordance with level I.

4.2.3 Sampling for dimensional and visual examination of end item. Sampling of retaining straps for these characteristics shall be in accordance with inspection level S-4.

4.2.4 Sampling for tests. Samples for test shall be in accordance with inspection level S-1.

4.3 Inspection and tests. The acceptable quality levels (AQL's) shall be in accordance with MIL-STD-105.

4.3.1 Inspection. Packaged and packed retaining straps selected in accordance with 4.2.2 and in 4.2.3 shall be examined in ac-

cordance with table V. The AQL's for defects listed in table V shall be 2.5 percent defective for major defects and 4.0 percent defective for minor defects.

TABLE V.—*Classification of defects*

Examine	Defect	Major	Minor
End item	Attaching holes, not aligned	X	
	Dimensions not as specified	X	
	Straps twisted or deformed	X	
	Coating not as specified	X	
	Cracks and splits	X	
	Burrs and chips		X
	Rust or rust stains		X
	Loose scale		X
	Surface pitted badly	X	
	Type III, style B, straps not anodized or chemically treated	X	

4.3.2 Visual and dimensional examinations. Samples selected in accordance with 4.2.3 shall be visually and dimensionally examined for conformance to tables I, II, III, and IV.

4.3.3 Lot acceptance tests. Samples selected in accordance with 4.2.4 shall be subjected to the tests in 4.4, AQL 10 percent defective.

4.4 Tests.

4.4.1 Zinc coated straps. Tests for the presence of zinc shall be conducted in accordance with method 523 of Fed. Test Method Std. No. 151 (3.3.1).

4.4.2 Cadmium coated straps. Tests for the presence of cadmium shall be conducted in accordance with method 523 of Fed. Test Method Std. No. 151 (3.3.1 and 3.3.2.1).

4.5 Acceptance inspection of preparation for delivery. The preservation, packaging, packing, and marking shall be examined and tested to determine compliance with section 5 of this specification.

5. PREPARATION FOR DELIVERY

(For civil agency procurement, the definitions and applications of the levels of packaging and packing shall be in accordance with Fed. Std. No. 102.)

5.1 Packaging. Packaging shall be level A or C, as specified (see 6.2).

5.1.1 Level A. Straps, of the same type, style, and size, shall be packaged in boxes conforming to PPP-B-566, style and type optional; PPP-B-665, style optional; PPP-B-676, type optional; or PPP-B-636, type I, class 1. The gross weight of each box shall not exceed the weight limitations of the applicable box specification. The boxes shall be sealed and closed in accordance with the applicable box specification or appendix thereto.

5.1.2 Level C. The straps shall be packaged in accordance with the suppliers standard commercial practice.

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

5.2.1 Level A. The straps of like type, style, and size shall be packed in close fitting boxes conforming to PPP-B-621, class 2, style optional; or to PPP-B-601, overseas type, style optional; or to PPP-B-636, class 2, V3C, style optional. The wood boxes shall be strapped in accordance with the appendix to the applicable box specification. The fiberboard boxes shall be reinforced with bands of filament tape in accordance with the appendix to the box specification. The gross weight of the wood boxes shall not exceed 200 pounds, of the fiberboard boxes 70 pounds.

5.2.2 Level B. The straps shall be packed as specified in 5.2.1 except that the containers shall be class 1 and domestic type.

5.2.3 Level C. The straps shall be packed to insure carrier acceptance and safe delivery to destination in containers complying with the rules and regulations applicable to the mode of transportation.

5.3 Marking.

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

5.3.2 Military activities. In addition to any special marking specified in the contract or order, marking for shipment shall be in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use. The straps are used to fasten pipes, conduit, tubing and cables to fixed structures.

6.2 Ordering data. Purchasers should exercise any desired options offered herein, and procurement documents should specify the following:

- (a) Title, number and date of this specification.
- (b) Type and style of retaining strap (1.2.1).
- (c) Size (1.2.2).
- (d) Size of lot, if different from 4.2.1.
- (e) Level of packaging and packing (5.1 and 5.2).

6.3 Transportation description. Transportation descriptions and minimum weight applicable to this commodity are:

*Type I, Styles A and B; Type II, Style A;
Type III, Style A*

Rail:

Hangers, pipe, not otherwise indexed by name, iron or steel.

Carload minimum weight 40,000 pounds.

Motor:

Hangers, pipe, not otherwise indexed, iron or steel.

Truckload minimum weight 40,000 pounds, subject to Rule 115, National Motor Freight Classification.

Type III, Style B

Rail:

Straps, aluminum.

Carload minimum weight 30,000
pounds.

Motor:

Straps, aluminum.

Truckload minimum weight 30,000
pounds, subject to Rule 115, Na-
tional Motor Freight Classification.

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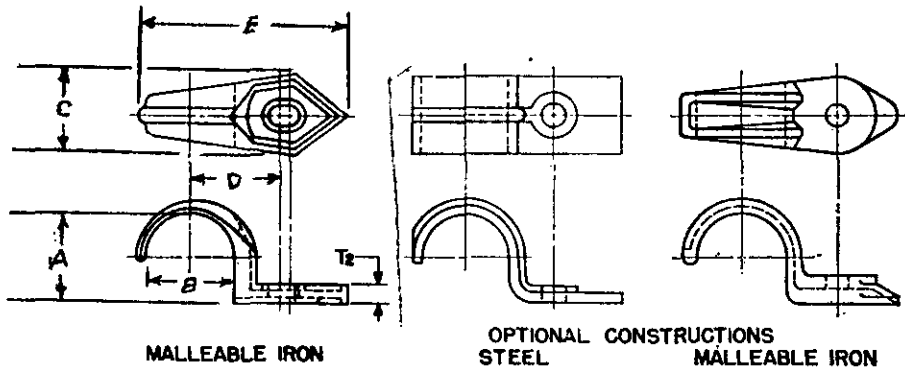


Figure 1
Type I, Style A

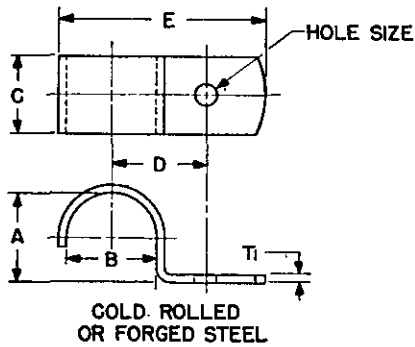


Figure 2
Type I, Style B

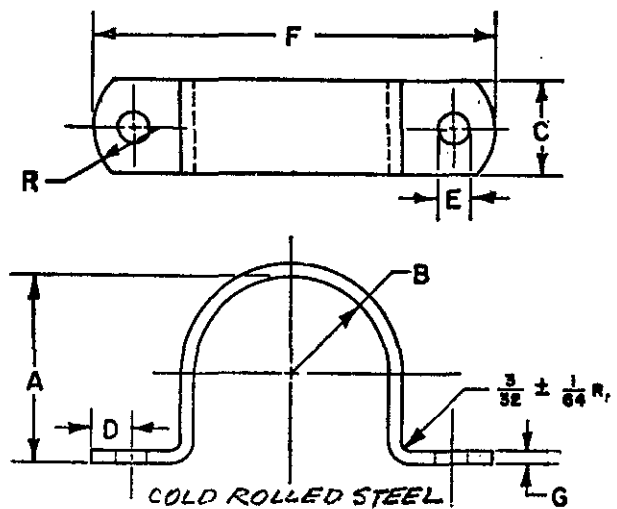


Figure 3
Type II, Style A

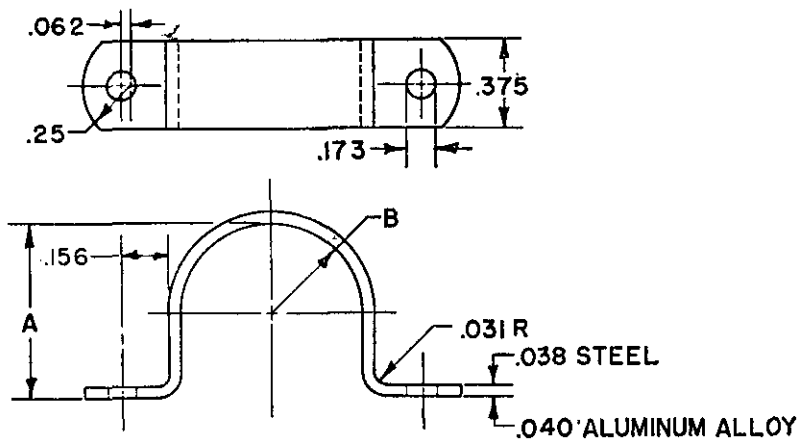


Figure 4
Type III, Style A and B

Copies of this specification may be purchased for 5 cents each.