

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	Changed height tolerance on figure 1. Changed measurement requirements in 4.4.2. Added two vendors in 6.5. Editorial changes throughout.	4 Mar 91	Randy Larson
B	Incorporated boilerplate updates.	19 Nov 10	Michael A. Radecki
C	Added Distribution Statement A.	27 Mar 19	Michael A. Radecki

CURRENT DESIGN ACTIVITY CAGE CODE 037Z3  
 DEFENSE LOGISTICS AGENCY  
 DEFENSE SUPPLY CENTER COLUMBUS  
 COLUMBUS, OHIO 43218-3990



Prepared in accordance with ASME Y14.100

Source Control Drawing

<b>REV STATUS OF PAGES</b>	<b>REV</b>	C	C	C	C	C	C	C	C								
	<b>PAGES</b>	1	2	3	4	5	6	7	8								

<b>PMIC N/A</b>	<b>PREPARED BY</b> Jim B. Walker	<b>DESIGN ACTIVITY</b> DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OH 45444-5000	
Original date of drawing  31 October 1990	<b>CHECKED BY</b> Bud Boulter	<b>TITLE</b> SHIELDING TAPE, EMI, KNITTED WIRE MESH	
	<b>APPROVED BY</b> Randy Larson		
	<b>SIZE</b> A	<b>CODE IDENT. NO.</b> 14933	<b>DWG NO.</b>  <b>90095</b>
	<b>REV C</b>		<b>PAGE 1 OF 8</b>

## 1. SCOPE

- 1.1 Scope. This drawing covers the requirements for a knitted wire mesh tape suitable for EMI shielding, grounding, and static discharge applications.
- 1.2 Part or Identifying Number (PIN). The complete PIN shall be as follows:



## 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 of documents cited in sections 3 and 4 of this specification, whether or not they are listed.
- 2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

[ASTM-B520](#) - Wire Steel, for Electronic Applications, Tin-Coated, Copper-Clad.

(Copies of these documents are available online at <http://www.astm.org> .)

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERING (IEEE)

[IEEE 299](#) - Enclosures, Electromagnetic Shielding, Measuring the Effectiveness of.

(Copies of these documents are available online at <http://www.ieee.org>.)

- 2.3 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a 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 Interface and physical dimensions. Interface and physical dimensions shall be as specified on [figure 1](#). The tape is available in 25 feet, 100 feet, and 1,000 feet lengths as indicated.
- 3.2 Material. The shielding tape shall be made of tin-lead coated, copper-clad steel wires. The wire size shall be  $.0045 \pm .0005$  inches in diameter, in accordance with [ASTM-B520](#).
- 3.3 Cross section. The cross section and Sn/Cu/Fe distribution of the individual wires shall be as specified on [figure 2](#).
- 3.4 Weight. Maximum weight shall be 8.4 ounces per 100 feet.
- 3.5 Characteristics.
- 3.5.1 Pull strength. The minimum pull strength shall be 40 pounds.
- 3.5.2 Elongation. The maximum elongation shall be 100 percent.

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3.5.3 Shielding effectiveness. The shielding effectiveness of the tape shall be in accordance with [table I](#). The test method shall be in accordance with [4.4.3](#).

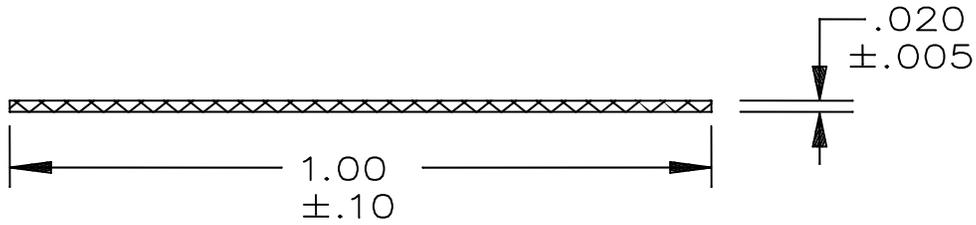
TABLE I. Shielding effectiveness.

Frequency	Minimum value
100 kHz, H-field	45 dB
10 MHz, E-field	60 dB
1 GHz, plane wave	40 dB
10 GHz, plane wave	30 dB

3.6 Tape length versus cable size. Recommended tape lengths and cable sizes are shown on [figure 3](#).

3.7 Methods for applying. The tape should be wrapped around the cable assembly. Wrap the main cable and terminate the tape before beginning to wrap the cable branch. Start and end all helical wrapping with a minimum of two overlapping circumferential wraps. At branch connections, start at least 4 inches before and after the branch to assure adequate tape coverage of the "V" section. Branch connections should not be designed to occur within 4 inches (101.6 mm) of each other. Recommended lead for most applications is .5 inch (12.7 mm), although some additional shielding will be achieved when utilizing a .25-inch (6.35 mm) lead. The length of tape required for each cable using these two types of lead wraps is shown on [figure 3](#).

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PIN 90095-	Length (feet)
001	25
002	100
003	1,000

Inch	mm	Foot	Meter
.002	0.05	25	7.62
.020	0.51	100	30.48
.10	2.5	1,000	304.80
1.00	25.4	---	---

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.

FIGURE 1. Dimensions and configuration.

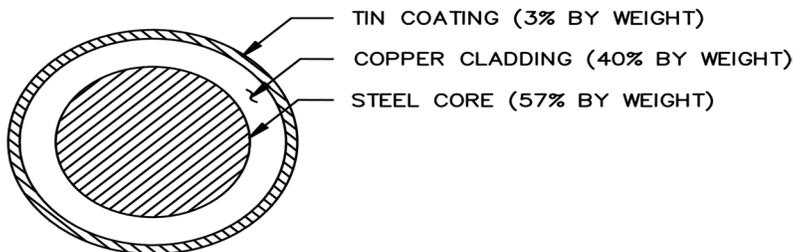
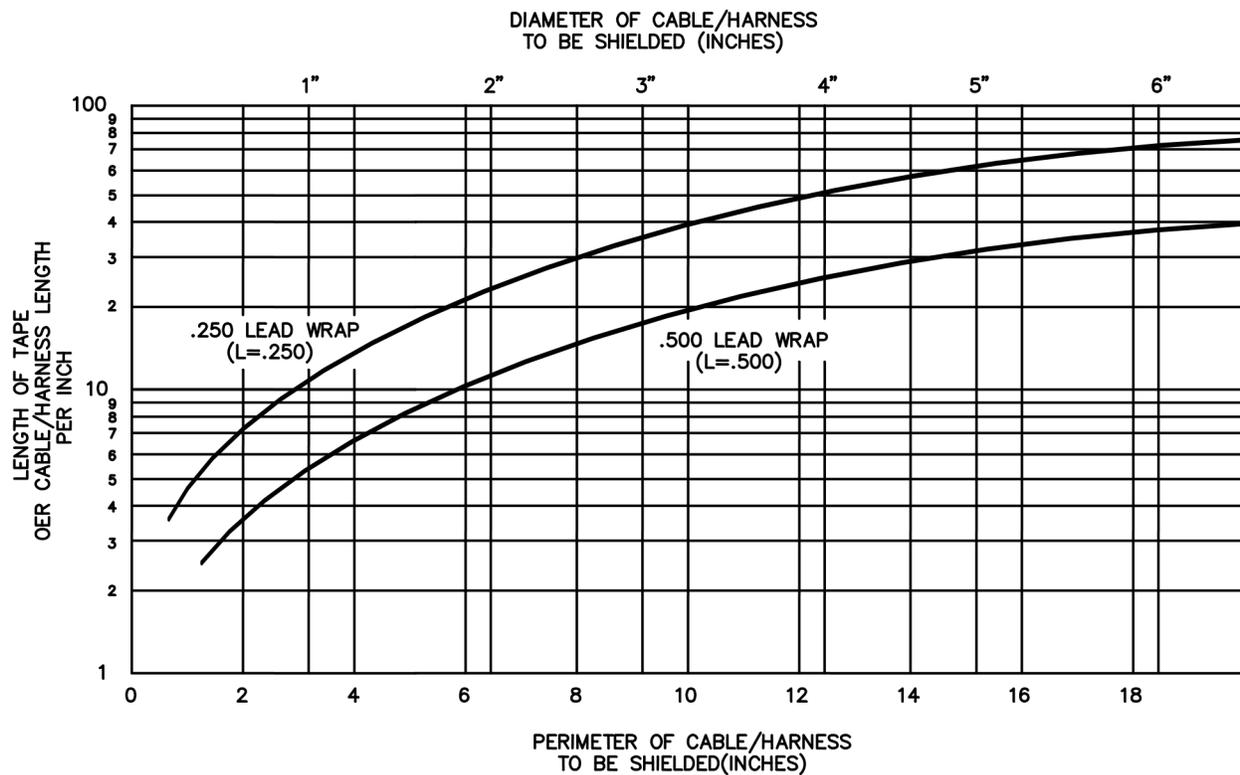


FIGURE 2. Cross section and SN/Cu/Fe distribution.

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NOTE: For each termination and/or branch connection, add 30 inches (762.0 mm) of tape to anticipated usage.

FIGURE 3. Tape length versus cable size.

- 3.8 Termination. The tape may be terminated by means of silver-filled, conductive epoxy, soldering, or clamping.
- 3.9 Recycled, recovered, environmentally preferable, or biobased materials. Recycled, recovered, environmentally preferable, or biobased materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.
- 3.10 Certificate of compliance. A certificate of compliance shall be required from manufacturers requesting to be an approved source of supply.
- 3.11 Marking. Tape need not be marked. Packages shall be marked in accordance with 5.1.
- 3.12 Workmanship. Tape shall be representative of controlled industrial techniques. Surfaces shall be free of dirt, kinks, scale, lumps, corrosion, or other defects which could affect the life, serviceability, or performance of the tape.

4. VERIFICATION

- 4.1 Sampling and inspection. Unless otherwise specified, sampling and inspection procedures shall be performed in accordance with table II.

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4.2 Conformance inspection.

4.2.1 Inspection of product for delivery. The inspection of the product for delivery shall consist of the group A inspection as specified in [table II](#).

TABLE II. Group A inspection.

Inspection	Requirement paragraph	Test method paragraph	Number of allowable defects
Dimensions	3.2	4.2.3 and 4.4.2	0

4.2.2 Inspection lot. An inspection lot shall consist of all tape and test specimens made from one batch.

4.2.3 Sampling inspection for dimensions. A dimension measurement shall be made on each roll or spool at a point 3 feet from its end.

4.3 Rejected lots. If an inspection lot is rejected, the supplier may rework it to correct the defects, then resubmit the lot for inspection. Resubmitted lots shall be inspected using tightened inspection procedures. Such lots shall be separated from new lots and shall be clearly identified as re-inspected lots.

4.4 Methods of inspection.

4.4.1 Test conditions. Unless otherwise specified, the inspections and tests shall be performed at a temperature of +20°C ±5°C, a relative humidity of 45 to 75 percent, and an atmospheric pressure of 650 to 800 millibars of mercury.

4.4.2 Visual inspection. A visual inspection shall be made to verify conformance to the requirements for dimensions, materials, marking, and workmanship (see [3.1](#), [3.2](#), and [3.12](#), respectively). The height dimension (H) shall be measured using a dial gauge with a 2-ounce to 4-ounce load and a .75-inch (19.05 mm) anvil. The width dimension (W) shall be measured with either an optical X-Y table microscope with an electronic output accurate to .001 inch (0.03 mm), or a vernier caliper accurate to .001 inch (0.03 mm).

4.4.3 Shielding effectiveness (see [3.5.3](#)). A shielding effectiveness test shall be performed in accordance with [IEEE-299](#), except that the aperture size shall be 5 by 5 inches (127.0 mm). The shielding tape shall be used as an interface gasket between the aperture plate and the shielded enclosure.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see [6.2](#)). When packaging of materiel is to be performed by DoD or in-house contractor 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 activities within the Military Service or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

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6. NOTES

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

- 6.1 Intended use. Shielding tape manufactured in accordance with this drawing is intended to be used when military specifications do not exist or when qualified products that will perform the required function are unavailable.
- 6.2 Acquisition requirements. The contract or purchase order should specify the following:
  - a. Complete PIN (see 1.2).
  - b. Requirements for delivery of one copy of the conformance inspection data or certificate of compliance that parts have passed conformance inspection with each shipment of parts by the manufacturer.
  - c. Requirement for the manufacturer to notify the contracting activity in the event of a change in the product.
  - d. Requirements for packaging and packing.
- 6.3 Replaceability. Shielding tape covered by this drawing shall replace similar commercial products manufactured in accordance with contractor - prepared specifications and drawings.
- 6.4 Users of record. Coordination of this document for future revisions is coordinated only with the approved source(s) of supply and the users of record of this document. Requests to be added as a recorded user of this drawing may be achieved online at <mailto:relay@dla.mil> or if in writing to: DLA Land and Maritime, Columbus, ATTN: DLA Land and Maritime/VAT, Post Office Box 3990, Columbus, OH 43218-3990 or by telephone (614) 692-4481 or DSN 850-4481.
- 6.5 Approved source(s) of supply. Approved source(s) of supply are listed herein. Additional sources will be added as they become available. Assistance in the use of this drawing may be obtained online at <mailto:relay@dla.mil>, or by contacting DLA Land and Maritime, ATTN: DLA Land and Maritime-VAT, Post Office Box 3990, Columbus, OH 43218-3990 or by telephone (614) 692-4481 or DSN 850-4481.

DLA Land and Maritime drawing PIN 90095-	Similar vendor PIN <u>1/</u>			
	CAGE 18565	CAGE 27565	CAGE 53TQ8	CAGE 0V7J1
001	03-0804-C902	395-001	23-50225	38-1015-0440
002	03-0804-C903	395-002	23-50200	38-1015-0441
003	03-0804-C904	395-003	23-04016	38-1015-0442

1/ Parts must be purchased to the DLA LAND AND MARITIME PIN to assure that all performance requirements and tests are met.

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Vendor CAGE  
number

Vendor name  
and address

18565

Parker-Hannifin Corporation,  
Parker Chomerics Division  
77 Dragon Court  
Woburn, MA 01888-1039  
(781) 939-4311

27565

Ja-Bar Silicone Corporation  
252 Brighton Road  
Andover, NJ 07821-5032  
(973) 786-5000

53TQ8

Parker-Hannifin Corporation  
Chomerics Division  
135 Bryant Street  
Cranford, NJ 07016-3212  
(781) 939-4311

0V7J1

Effective Shielding Company, Inc.  
817 Lincoln Avenue  
West Chester, PA 19380-4435  
(610) 429-9449

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