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 SUPERSEDING
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FEDERAL SPECIFICATION

SEALS, ANTIPIILFERAGE

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

1. SCOPE

1.1 Scope. This specification covers 9 styles and 18 types of antipilferage

seals. These seals are not intended to resist a forced entry attack. The generic classification of seals utilized in this specification is based on work published by Sandia Laboratories (see 6.6). This is not to imply that other seals do not exist. Other seals for use in higher antipilferage security applications fall outside the scope of this specification. Users of this document are reminded to refer to their individual agencies' Physical Security Manual and the Department of Defense manual 5100.76-M as appropriate.

1.2 Classification. Seals described herein are classified by the following styles and types.

Classification:

PIN Code:

Style A - Wire	A
Type 1 - Crimp	01
2 - Fold	02
3 - Cup	03
Style B - Padlock	B
Type 4 - Wire Shackle	04
5 - Plastic Shackle	05
6 - Steel Shackle	06

Beneficial comments (recommendations, additions, deletions) and any pertinent
 *data which may be of use in improving this document should be addressed to: *
 *Commanding Officer (Code 156), Naval Construction Battalion Center, Port *
 *Hueneme, CA 93043-5000, by using the self-addressed Standardization *
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 *document or by letter. *

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Classification:	PIN code: (continued)
Style C - Strap	C
Type 7 - Car/Box End	07
8 - Car/Plastic	08
9 - Car/Ball End	09
10 - Crimp, Special Marking	10
Style D - Cable	D
Type 11 - One Piece	11
Type 12 - Two Piece	12
Style E - Bolt	E
Type 13 - Threaded	13
Type 14 - Unthreaded	14
Style F - Pull-Tight (Cinch)	F
Type 15 - Plastic Tie	15
Style G - Twist	G
Type 16 - Wire, Weakened	16
Style H - Scored	H
Type 17 - Metal, Scored or Notched	17
Style J - Label	J
Type 18 - Nonmetallic, Pressure Sensitive Backing	18
Style K - Fiber Optic	K
Type 19	19

1.2.1 Part or identifying number. Seals covered by this specification are identified by a PIN. The PIN consists of a five digit alpha-numeric document identifier plus the PIN code. See 1.2 (right hand column) for the PIN code and 6.3. The construction of the PIN is indicated below:

F-2738	-	XXX	-	X	-	X	-	XX
Document identifier-----*		*		*		*		*
		*		*		*		*
Style and type code-----*		*		*		*		*
		*		*		*		*
Body or crimp material-----*		*		*		*		*
		*		*		*		*
Shackle or wire material-----*		*		*		*		*
		*		*		*		*
Length in inches-----*		*		*		*		*

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this document to the extent specified herein. Unless

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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).

Federal Specifications

A-A-204 - Label Tape, Pressure Sensitive Adhesive.
 QQ-S-781 - Strapping Steel and Seals.
 UU-L-49 - Label, Paper, Gummed (Water Activated).
 UU-L-1644 - Label, Paper, Pressure-Sensitive Adhesive.
 PPP-B-566 - Boxes, Folding, Paperboard.
 PPP-B-601 - Boxes, Wood, Cleated-Plywood.
 PPP-B-636 - Boxes, Shipping, Fiberboard.

Military Standards

MIL-STD-105 - Sampling Procedures and Tables for Inspection by
 Attributes.
 MIL STD 129 - Marking for Shipment and Storage.
 MS51938 - Seal, Metallic, Lead and Wire.

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

2.1.2 Another Government document. The following document forms a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

Nuclear Regulatory Commission (NRC)

NRC Regulatory Guide (RG) 5.10 - Selection and Use of Pressure Sensitive
 Seals on Containers for on Site Storage
 of Special Nuclear Material July 1973

(Application for copies should be addressed to the Nuclear Regulatory Commission, Washington, DC 20545.)

(Copies of specifications, standards, handbooks, drawings, publications, and other Government documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Other publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

ASTM

ASTM F 1158 - Standard Guide for Evaluation of Tampering of Security
 Seals

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

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(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

3. REQUIREMENTS

3.1 First article. When specified, the contractor shall furnish ten seals for first article inspection and approval (see 4.3, 6.2, and 6.4).

3.2 Materials. Materials used shall be free from defects which would adversely affect the performance or maintainability of individual components of the overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice. Unless otherwise specified herein, all equipment, material, and articles incorporated in the work covered by this specification are to be new and fabricated using materials produced from recovered materials to the maximum extent possible without jeopardizing the intended use. The term "recovered materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. Unless otherwise specified none of the above shall be interpreted to mean that the use of used or rebuilt products are allowed under this specification.

3.4 Standard commercial product. The seals of the same classification shall, as a minimum, be in accordance with the requirements of this specification and may be the manufacturer's standard commercial product. Additional or better features which are not specifically prohibited by this specification but which are a part of the manufacturer's standard commercial product, shall be included in the seals being furnished. A standard commercial product is a product which has been sold or is currently being offered for sale, on the commercial market through advertisements or manufacturer's catalogs or brochures, and represents the latest production model.

3.5 Resistance to surreptitious attack or tampering. Each seal shall resist surreptitious attack or tampering as specified herein. Should the seal be defeated or compromised by these manipulations, telltale marks or evidence shall be so indicated by inspection and performance evaluation.

3.6 Description.

3.6.1 Style A - wire, type 1 - crimp. Various types of crimp/wire seals are in common use. Essentially crimp/wire seals consist of a small piece of metal with holes for the passage of the sealing wire. The wire is passed through the closure hasp on the container to be sealed and then through the holes in the metal piece, which is then compressed to grasp the wire.

3.6.1.1 Physical requirements. Crimp/wire seals shall be either lead block type conforming to MS51938 or aluminum or steel sheet with formed holes. Crimp/wire seals shall be furnished with or without marking in accordance with 3.7 as specified (see 6.2). Wire furnished with crimp wire seals shall be spiral wound, single strand, two or 3 ply galvanized or stainless steel wire to be specified by user.

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3.6.1.2 Resistance to tampering. The seals shall resist tampering for a period of at least 30 seconds.

3.6.2 Style A - wire, type 2 - folding. This seal uses a spiral wound wire, single strand, two or 3 ply galvanized or stainless steel to be specified by user. the wire is passed through the closure hasp on the container to be sealed. The ends are then inserted into a metal box which is locked onto the serrations of the wire. The metal box is provided with points of frangibility to prevent undetected reopening.

3.6.2.1 Physical requirements. Folded wire seals shall be formed sheetmetal boxes which can be locked onto a piece of wire. Boxes shall fracture upon reopening. Boxes shall be coated with material which will discolor upon heating. Boxes shall be marked in accordance with 3.7. Wire furnished with folding wire seals shall be spiral wound.

3.6.2.2 Resistance to tampering. The seals shall resist tampering for a period of at least 2 minutes.

3.6.3 Style A - wire, type 3 - cup. This seal consists of three cup shaped sheetmetal stampings, which mate together one way to form an enclosure protecting a crimp wire seals's crimp point. One hole allows the wire to exit and to pass through a hasp and return. It is a protected crimp seal, or two seals in one. The interior of this seal lends itself to distinctive markings prior to sealing which if photographically recorded can be used to confirm authenticity of the seal when opened.

3.6.3.1 Physical requirements. Cup seals shall consist of formed sheet metal parts which snap together to form boxes over the knotted wire. Boxes shall not be openable without damage to the box. The box shall be marked in accordance with 3.7. Wire furnished with cup/wire seals shall be 15 strand stainless steel.

3.6.3.2 Resistance to tampering. The seals shall resist tampering for a period of at least 10 minutes.

3.6.4 Style B - padlock, type 4 - wire shackle. This seal uses a spring wire shackle which passes through the hasp and is inserted into a block shaped in such a way that once the wire springs into position the shackle cannot be removed without tearing or deforming the block.

3.6.4.1 Physical requirements. Wire shackle padlock seals shall be furnished with either a molded plastic body or a stamped metal body. The wire shall be galvanized or stainless steel of 0.047, 0.041, or 0.055 inch diameter as specified by the user. The body shall be marked in accordance with 3.7.

3.6.4.2 Resistance to tampering. The stamped metal body seal shall resist tampering for a period of at least 1 minute. The plastic body seal shall resist tampering for a period of at least 15 seconds.

3.6.5 Style B - padlock, type 5 - plastic shackle. This seal consists of one piece of molded plastic shaped similar to a padlock. The shackle is provided with locking devices to engage in the body of the seal. Points of

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frangibility are provided on the shackle if desired for hand breaking on both sides of wire hasp. This should be noted as "scoring required". Non-scored seals normally require a cutting tool for removal.

3.6.5.1 Physical requirements. The hasp opening shall be nominally 1 inch by 1/2 inch. The seal shall be marked in accordance with 3.7.

3.6.5.2 Resistance to tampering. The seal shall resist tampering for a period of at least 30 seconds.

3.6.6 Style B - padlock, type 6 - steel shackle. These padlock seals are keyless locks. The body of the seal contains the locking mechanism. A hardened shackle is utilized.

3.6.6.1 Physical requirements. All padlock seals shall have both pieces marked in accordance with 3.7.

3.6.6.2 Resistance to tampering. The seal shall resist tampering for a period of at least 2 minutes.

3.6.7 Style C - Strap, type 7 - car/box end. This seal employs a strap which passes through a staple to secure a hasp. One end of the strap is folded and crimped to form a box which contains a capture mechanism. The other end, when inserted into the box is captured forming a seal.

3.6.7.1 Physical requirements. The car/box end seal shall consist of a metal strap not less than 6 inches long and not less than 0.3 inches wide and a comparable metal box. The seal strap shall be marked in accordance with 3.7.

3.6.7.2 Resistance to tampering. The design of this type of seal provides at least 15 seconds resistance to tampering, but probably precludes its detection.

3.6.8 Style C - strap, type 8 - car/plastic. This seal is a plastic version of the type 7 and 8 car seal. One end of the strap locks into a plastic capture device, molded on the other end of the strap.

3.6.8.1 Physical requirements. The car/plastic seal shall consist of a thermosetting plastic strip not less than 6 inches long and not less than 0.3 inches wide. The seal shall be marked in accordance with 3.7.

3.6.8.2 Resistance to tampering. The seal shall resist tampering for a period of at least 30 seconds.

3.6.9 Style C - strap, type 9 - car/ball end. The car/ball end seals are steel strap or aluminum strap seals with a comparable metal ball as specified (see 6.2). The latching mechanism is two or more piano-wire loops which capture both ends of the strap within the ball, when sealed.

3.6.9.1 Physical requirements. The car/ball end seal shall consist of a metal strap not less than 6 inches long and not less than 0.3 inches wide and comparable metal ball. The seal shall be marked in accordance with 3.7.

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3.6.9.2 Resistance to tampering. The seal shall resist tampering for a period of at least 5 minutes.

3.6.10 Style C - strap, type 10 - crimp, special marking. Strap seals are standard steel strapping closures with a controlled lithographic design and with special marking.

3.6.10.1 Physical requirements. Strap seals shall conform to QQ-S-781. Lithography and marking shall be as specified (see 6.2).

3.6.10.2 Resistance to tampering. The seal shall resist tampering for a period of at least 5 minutes.

3.6.11 Style D - cable, type 11 - one piece. These cable seals are high strength seals using 0.1875 or 0.25 inch diameter aircraft cable which either has a swaged capture device at one end or both ends. When at only one end, the device captures the inserted cable directly and can be cinched up on the staple or hasp. If at both ends, then one end is a male which fits into the other end's swaged female fitting.

3.6.11.1 Physical requirements. As specified (see 6.2) the cable shall be a minimum of 0.1875 or 0.25 inch diameter of galvanized steel for pull through seals. The cable shall be a minimum of 8 inches long from the locking mechanism to the end of the cable.

3.6.11.2 Resistance to tampering. The seal shall resist tampering for a period of at least 30 seconds.

3.6.12 Style D - cable, type 12 - two piece. The two piece seal consists of a piece of steel cable to which a separate locking mechanism is connected at the time of sealing. The attachment of the locking mechanism may be either to the cable or to an attached locking point on the cable.

3.6.12.1 Physical requirements. As specified (see 6.2), the cable shall be a of minimum 0.1875 or 0.25 inch diameter galvanized steel. Both pieces of a two piece seal shall be marked in accordance with 3.7.

3.6.12.2 Resistance to tampering. The design of the locking device shall be such that when locked the seal is tamper resistant to the extent that it will not unlock as a result of manipulation with a pin, wire, pick, knife, thin piece of metal or any other tool without leaving visible evidence of tampering, or if unlocked, being damaged so that they cannot be relocked. The seal shall resist tampering for a period of at least 30 seconds.

3.6.13 Style E - bolt.

3.6.13.1 Type 13 - threaded. The threaded bolt seal shall consist of a threaded bolt and spin nut. Bending of the bolt shall upset the threads to such an extent that the nut will not unscrew.

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3.6.13.2 Type 14 - unthreaded. The unthreaded bolt seals shall consist of an unthreaded pin and locking cylinder. When the pin is inserted in the cylinder, a notch on the pin shall be captured by a locking ring, locking the seal.

3.6.13.3 Physical requirements. Both pieces of the bolt seal shall be marked in accordance with 3.7 if the locking end is reusable.

3.6.13.4 Resistance to tampering. The seal shall resist tampering for a period of at least 5 minutes for type 13 and 30 seconds for type 14.

3.6.14 Style F - pull-tight (cinch), type 15 - plastic tie. This one piece plastic seal consists of two parts, a string or slender strap that is connected to a capture device at one end. The free end is inserted through the capture device and cinched. Spring fingers grasp the serrated string and prevent its removal.

3.6.14.1 Physical requirements. The plastic tie seal shall be marked in accordance with 3.7.

3.6.14.2 Resistance to tampering. The seal shall resist tampering for a period of at least 30 seconds.

3.6.15 Style G - twist, type 16 - bendable wire. This seal is a piece of wire which can be bent once but fails when an attempt is made to reverse the bending.

3.6.15.1 Physical requirements. The bendable wire seal shall be marked in accordance with 3.7.

3.6.15.2 Resistance to tampering. It shall require force to remove, using cutting tools. The seal shall resist tampering for a period of at least 2 minutes.

3.6.16 Style H - weakened, type 17 - notched metal. This seal is a metal strip which is notched. The strip is passed through the hasp and bent at the notch. To remove the seal requires bending the metal strip at the notch again which results in breakage.

3.6.16.1 Physical requirements. The notched metal seal shall be marked in accordance with 3.7.

3.6.16.2 Resistance to tampering. The seal shall resist tampering for a period of at least 1 minute.

3.6.17 Style J - label, type 18 - nonmetallic. This seal has paper or plastic backing, one surface of which is coated with a layer of adhesive. After proper application this type of seal is difficult to remove without an indication that tampering has occurred (see 6.2).

3.6.17.1 Physical requirements. Label seals shall conform to one or more of the following requirements: NRC RG 5.10, UU-L-49, UU-L-1644, and A-A-204.

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3.6.18 Style K - Fiber Optic, type 19. This seal system consists of a fiber cable, 16 strand or more, a plastic body, a seal assembly tool, and a Photomicrographic camera (still or videotape).

3.6.18.1 Physical requirements. Fiber optic seals when locked, should have both ends of the fiber bundle held by the lock body in position for camera verification of optic ends. The seals shall be marked in accordance with 3.7.

3.6.18.2 Resistance to tampering. The photographic pictures should always reflect tampering by light loss or bundle disturbance. The seal is used for high security.

3.7 Marking. All seals shall be marked with letters and numerals as specified herein and in accordance with manufacturers standard practice (see 6.2).

3.7.1 Letters. Unless otherwise specified, the seals shall be marked with the letters "US" and agency initials specified by the ordering agency (see 6.2).

3.7.2 Serial numbers. All seals shall be marked with consecutive serial numbers. The serial numbers marked on the seals shall not be provided in duplicate. Serial numbers should be specified by the ordering agency. Alpha numeric serial numbers are permitted unless specifically prohibited (see 6.2).

3.7.3 Marking location. All marked seals shall be marked on the main body of the seal. Seals constructed in more than one piece shall have the same serial number marked on each piece except for the wire used in types 1, 2, 3, and 4 or break-off type set screws used in types 6, 11, 12, and 13. Any part(s) that can be reused after removal shall also be marked.

3.8 Finish. When specified (see 6.2), and when not otherwise specified herein, the finish shall be tinned, galvanized, painted, or other finish if the manufacturers option is not acceptable. When color is a disqualifying factor, it shall also be as specified in the contract.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor 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 this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for

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acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.2 Classification of inspection. Inspection shall be classified as follows:

- a. First article inspection (see 4.3).
- b. Quality conformance inspection (see 4.4).
- c. Packaging inspection (see 4.8).

4.3 First article inspection. First article inspection shall be performed on the sample seals when a first article sample is required (see 3.1, 6.2 and 6.4). This inspection shall include the examination of 4.6 and tests of 4.7. The first article may be a standard production item from the contractor's current inventory provided the seal meets the requirements of this specification and is representative of the design, construction, and manufacturing technique applicable to the remaining seals to be furnished under the contract.

4.4 Quality conformance inspection. Quality conformance inspection shall be performed on the sample seals selected in accordance with 4.5.1 and 4.5.2. This inspection shall include the examination of 4.6 and the tests of 4.7.

4.5 Sampling plan.

4.5.1 Sampling for examination. Sampling for examination shall be based on inspection level S-3 and an Acceptable Quality Level (AQL) of 2.5 percent defective in accordance with MIL-STD-105.

4.5.2 Sampling for tests. Sampling for tests shall be based on inspection level S-2 and an AQL of 2.5 percent defective in accordance with MIL-STD-105.

4.5.3 Inspection lot. All seals of the same type and size offered for delivery at one time shall be considered a lot for the purpose of inspection.

4.6 Examination. Each sample selected in accordance with 4.5 shall be examined for compliance with the requirements of this specification. Any redesign or modification of the contractor's standard product to comply with specified requirements, or any necessary redesign or modification following failure to meet specified requirements, shall receive particular attention for adequacy and suitability. This element of inspection shall encompass all visual examinations and dimensional measurements as specified herein and will serve to ensure that product offered is identical with or better than the product tested and accepted for the awarded contract.

4.7 Tests. Each sample of seal shall be tested and any seal failing to pass the following tests shall be rejected. When specified in the contract, a certificate of compliance (see 6.2), approved by the contracting officer, may be accepted as evidence that the seal has passed the required tests. The

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certificate shall be from a laboratory approved by the U.S. Government. Tests shall be conducted as outlined in the referenced documents and as specified herein.

4.7.1 Preparation for inspection. The seal(s) shall be manually locked, or closed, or applied (by crimping, twisting, bending, inserting, etc.) as intended by design. After locking, subject the seal(s) to be tested to a non-destructive attack in an attempt to defeat, compromise, or remove, and reapply the seal by any surreptitious action, tampering, manipulation, or any other method without leaving evidence of the attack. After this function, continue with the inspection. The seal(s) shall perform, and resist the attacks of section 3 for the minimum period specified.

4.7.1.1 Closure test. The seal shall be manually locked or closed (by crimping, twisting, bending, inserting, etc.) as intended by design. After locking, attempt to withdraw the leading edge or lock-point from the locking device by twisting, pulling, or otherwise manipulating the seal body. Failure of the leading edge or lock-point to enter the locking device when inserted manually, or failure of the locking device to retain its grip on the leading edge or lock-point after being twisted, pulled or otherwise manipulated shall constitute failure of this test. Seals that can be relocked after opening by manipulation shall fail the tests.

4.7.1.2 Style A and D seals. Inspect and evaluate as specified in ASTM F 1158 for group 1 seals.

4.7.1.3 Style C and F seals. Inspect and evaluate as specified in ASTM F 1158 for group 2, seals.

4.7.1.4 Style B and E seals. Inspect and evaluate as specified in ASTM F 1158 for group 3 seals.

4.7.1.5 Style G and H seals. Inspect and evaluate as specified in ASTM F 1158 for group 4 seals.

4.7.1.6 Style B, type 4 and 5 seals. Inspect and evaluate as specified in ASTM F 1158 for group 5 seals.

4.7.1.7 Style J seals. Attempt to remove or otherwise compromise the seal by any means available. If the seal can be removed or compromised without leaving telltale marks and can be reapplied without indication of compromise, shall constitute failure.

4.7.1.8 Style K seals. Attempt to compromise the seal without telltale evidence. Tampering shall be evident by light loss or bundle disturbance when checked with the proper camera.

4.8 Packaging inspection. The preservation, packing, and marking of the seals shall be inspected to determine compliance with the requirements of section 5 of this specification.

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5. PACKAGING

5.1 Preservation. Preservation shall be level A or commercial as specified (see 6.2).

5.1.1 Level A. Seals of like description shall be packaged in close-fitting boxes conforming to PPP-B-566 variety 2, or PPP-B-636 class weather-resistant. Cushioning shall be provided inside the boxes to prevent movement. The quantity in the unit package shall be specified by the procurement activity (see 6.2). Dimensions, weight, and closure of the boxes shall be in accordance with the applicable box specification.

5.1.2 Commercial. The seals shall be packaged in commercial containers. The quantity shall be the same as that normally used by the supplier for retail distribution.

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

5.2.1 Level A. The seals shall be packed in boxes conforming to PPP-B-601, overseas type or PPP-B-636, V2s. The contents shall be blocked and braced to prevent movement.

5.2.2 Level B. The seals shall be packed as specified for level A except the boxes shall conform to PPP-B-601 domestic type, or PPP-B-636, V3c or V3s. When specified (see 6.2), the boxes conforming to PPP-B-636 shall be class domestic.

5.2.3 Commercial. The seals shall be packed in commercial type shipping containers in a manner to insure carrier acceptance and safe delivery to destination. The quantity in each shipping container shall be the same as that normally used by the contractor for retail distribution. Packing and containers shall comply with applicable carrier rules and regulations.

5.3 Marking. In addition to any special marking required in the contract, unit packages and shipping containers shall be marked in accordance with MIL-STD-129.

6. NOTES

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

6.1 Intended use. A antipilferage seal is a passive device used to detect tampering or entry. A seal is not expected to present a serious obstacle to entry or tampering. The passive nature of seals is indicated in that inspection is required to determine whether entry or tampering has occurred.

Type 1 - In view of the fact that these seals may be easily counterfeited, they should not be used in applications requiring more than minimal antipilferage security. The crimp/wire seals are also unsuited to harsh or corrosive environments or applications requiring physical strength.

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Type 2 - The seals may be utilized in applications requiring moderate antipilferage security. Fold/wire seals are unsuited to harsh or corrosive environments or applications requiring physical strength.

Type 3 - Cup/wire type seals may be utilized with relative assurance in applications requiring moderate antipilferage security. Security personnel should be consulted for modification which may make these seals even more resistant to tampering. Cup/wire seals are unsuited to harsh or corrosive environments.

Type 4 - Wire shackle padlock seals provide relatively low antipilferage security.

Type 5 - Because of the wide variability in tamper resistance between models of plastic padlock seals they should be utilized in applications requiring low strength and minimal antipilferage security.

Type 6 - Steel shackle padlock seals are available which will resist tampering for periods of 2 minutes to in excess of 30 minutes. These should be utilized in applications requiring high strength and high antipilferage security.

Type 7 - The car/box end seal may be easily compromised. This type of seal should be used only for minimal antipilferage security requirements. This seal may be utilized where moderate physical strength is required.

Type 8 - Because of the wide variability in tamper resistance between models of car/plastic seals, they should be used in applications requiring minimal resistance to tampering. Car/plastic seals may be used in applications requiring low physical strength.

Type 9 - Car/ball end seals may be utilized in applications requiring minimal antipilferage security and physical strength.

Type 10 - Crimp type strap seals are standard steel strapping closures with a controlled lithographic design and with special marking used for shipping where more than normal antipilferage security is required.

Type 11 - One piece cable seals should be used in applications requiring high strength and low to moderate resistance to tampering.

Type 12 - Two piece cable seals should be used in applications requiring high strength and low to moderate resistance to tampering.

Types 13 and 14 - Bolt seals may be used in applications requiring high strength and low to moderate antipilferage security.

Type 15 - The plastic tie seal should be used in applications requiring low strength antipilferage security.

Type 16 - The notched metal seal shall be used in applications requiring low strength antipilferage security.

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Type 17 - The bendable wire seal shall be used in applications requiring high strength antipilferage security.

Type 18 - The label seal is used in sealing containers by overlapping the container parting line. The surface must be clean and smooth where the seal is applied. Very difficult to compromise but has almost no physical strength.

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

- a. Title, number and date of this specification.
- b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1).
- c. When first article is required (see 3.1, 4.3 and 6.4).
- d. Type of metal desired for the strap (see 3.6.9).
- e. Lithography and marking if different (see 3.6.10.1).
- f. Diameter of cable required (see 3.6.11.1 and 3.6.12.1).
- g. Type of lithography and marking required for type 18 seals (see 3.6.17).
- h. Whether marking is required on seals (see 3.7).
- i. When seals shall be marked other than as specified (see 3.7.1).
- j. Serial numbers required (see 3.7.2).
- k. When alpha numeric characters are prohibited (see 3.7.2).
- l. Finish and color required if other than manufacturers option (see 3.8).
- m. When certificate of compliance is acceptable (see 4.7)
- n. Level of preservation and level of packing required (see 5.1 and 5.2).
- o. Quantity of seals to be included in unit package (see 5.1.1).
- p. When domestic fiberboard boxes are to be used (see 5.2.2).

6.3 Part or identifying number (PIN). The PIN corresponds to the types of seals covered by this specification and defines the requirements of the options presented under this specification. The document identifier number, style and type code number, body or crimp material, and shackle or wire material are combined to form the PIN as shown in the following example:

Strap, Crimp special marking seal with a steel crimp clamp, a steel strap, and the strap is 50 inches long. P/N = F2738-C10-1-1-50

PIN code option assignments: Space one identifies style. Space two and three identifies type.

A01 - Crimp/wire
A02 - Fold/wire
A03 - Cup/wire

B04 - Wire shackle padlock
B05 - Plastic shackle padlock
B06 - Steel shackle padlock

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C07 - Car/box end
C08 - Car/plastic
C09 - Car/ball end
C10 - Strap, crimp, special marking

D11 - Cable/one piece
D12 - Cable/two piece

E13 - Bolt, threaded
E14 - Bolt, unthreaded
F15 - Pull-tight (cinch), plastic tie

G16 - Twist, weakened wire

H17 - Metal, notched or scored

J18 - Label, nonmetallic
K19 - Fiber optic

Space four identifies seal body, or crimp material.

0 Optional, at manufactures option
1 Steel
2 Lead
3 Aluminum
4 Plastic
5 Other

Space five identifies shackle, or wire material.

0 Optional, at manufactures option
1 Steel
2 Aluminum
3 Plastic
4 Other

Spaces six and seven identify length.

00 - Manufacturer's standard length in inches
01 to 99 - Optional length in inches as specified in the order

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TABLE I. PIN assignment options

* Material *				

* Style/Type	Body	Shackle/Wire	Length	*

* A01	0,1,2,3	0,1,2	.00,01 to 99. .	*
* A02	0,1,3	0,1,2	00,01 to 99. .	*
* A03	0,1,5	0,1,2	00,01 to 99. .	*
* B04	0,4	0,1,2	Optional . . .	*
* B05	0,4	0,3	Optional . . .	*
* B06	0,1	0,1	Optional . . .	*
* C07	0,1,3	0,1,2	00,01 to 99. .	*
* C08	0,4	0,3	00,01 to 99. .	*
* C09	0,1,3,4	0,1,2,4	00,01 to 99. .	*
* C10	0,1,3	0,1,2	00,01 to 99. .	*
* D11	0,1	0,1	00,01 to 99. .	*
* D12	0,1	0,1	00,01 to 99. .	*
* E13	0,1	0,1	00,01 to 99. .	*
* E14	0,1	0,1	00,01 to 99. .	*
* F15	0,4	0,3	00,01 to 99. .	*
* G16	0,1,3,5	0,1,2	00,01 to 99. .	*
* H17	0,1,3,5	0,1,2	00,01 to 99. .	*
* J18	0,5	0,3,4	00,01 to 99. .	*
* K19	0,0	0,0	00,01 to 99. .	*

6.3.1 Cross reference from MIL-S-23769 to FF-S-2738 by type, class, and style:

MIL-S-23769	FF-S-2738
Style (none)	Style A
Type 1	Type 1
2	2
3	3
Style (none)	Style B
Type 4	Type 4
5	5
6	6
Style (none)	Style C
Type 7	Type 7
8	8
9	9
Type 10	Type 11
Class A	Type 11
Class B	Type 11
Type 11	Type 12

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MIL-S-23769	FF-S-2738 (continued)
Style (none)	Style E
Type 12	(none)
Class A	Type 13
Class B	14
Style (none)	Style C
Type 13	Type 10
Style (none)	Style J
Type 14	Type 18
Style (none)	Style F
Type 15	Type 15
Style (none)	Style H
Type 16	Type 17
Style (none)	Style G
Type 17	Type 16
Style (none)	Style K
Type (none)	Type 19

6.4 First article. When a first article inspection is required, the contracting officer should provide specific guidance to offerors whether the items should be a preproduction sample, a first article sample, a first production item, a sample selected from the first production items, or a standard production item from the contractors current inventory and the number of items to be tested as specified (see 3.1 and 4.3). A first article sample unit consists of one seal. The contracting officer should include specific instructions in all acquisition instruments, regarding arrangements for examinations, tests and approval of the first article test results and disposition of the first articles. Invitations for bids should provide that the government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract. Bidders should not submit alternate bids unless specifically requested to do so in the solicitation.

6.5 Background information. Background information on the selection and use of seals and photographic examples of the different types may be found in the following sources:

"Security Seal Handbook" - David L. Poli, Sandia Laboratories (SAND 78-0400), December 1978.

"The Use of Seals as a Safeguard Tool" - Caesar Sastre, Brookhaven National Laboratories (BNL 13480) March 6, 1969.

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"Security Seals for the Protection and Control of Special Nuclear Material"
United States Nuclear Regulatory, Commission Regulatory Guide 5.15, January
1974.

6.6 Definitions. Seal, antipilferage - A passive, one-time locking device
used to detect tampering or entry, afford limited resistance to entry or
provide a combination of both.

Tamper - Non-destructive attack in an attempt to compromise the seal and
reapply the seal to cover up entry without leaving evidence of the defeat
(surreptitious attack).

6.7 Miscellaneous notes. This document is intended for use instead of
MIL-S-23769.

MILITARY INTERESTS:

Custodians:

Army - AR
Navy - YD

Review Activities:

Navy - SA
DLA - IS

User Activities:

Army - ME
Navy - SH, MC
Air Force - 99

CIVIL AGENCY COORDINATING ACTIVITIES:

GSA - 7FXE
NASA - MSF
ENERGY - DOE
POSTAL - USPS
TRANSPORTATION - OST
TREASURY - ATF, OAP
NSA - NS

PREPARING ACTIVITY:

Navy - YD

(Project 5340-1957)

Orders for this publication are to be placed with 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.

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Project 5340-1957

SUMMARY OF CHANGES FOR
MILITARY SPECIFICATION MIL-S-23769C
SEALS, ANTIPILFERAGE

FF-S-2738

The attached draft includes the following changes:

1. This is a new document. The text of MIL-S-23769C was transferred in its entirety into the format of a federal specification with minor rearrangement and rewording.
2. Classification was rearranged. A cross reference list is provided in 6.3.1.
3. Part identification numbers (PIN) were assigned, section 1.2 for pin codes and the structure of a PIN in 6.3.
4. ASTM F 1158 is used to check for quality assurance, see 4.7.2 thru 4.7.6.

FF-S-2738
AMENDMENT-1
31 January 1991

FEDERAL SPECIFICATION

SEALS, ANTIPIILFERAGE

This amendment, which forms a part of FF-S-2738, dated 7 June 1990, is approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

Page 13

Paragraph 6.1, TYPE 9: Change to read:

"TYPE 9 - Car/Ball end seals may be utilized in applications requiring more than normal antipilferage security, and moderate physical strength."

FSC 5340

MILITARY INTERESTS:

Custodians

Army - AR
Navy - YD

Review Activities

Navy - SA
DLA - IS

User Activities

Army - ME
Navy - SH, MC
Air Force - 99

CIVIL AGENCY COORDINATING ACTIVITIES:

GSA - 7FXE
NASA - MSF
ENERGY - DOE
POSTAL - USPS
TRANSPORTATION - OST
TREASURY - ATF, OAP
NSA - NS

PREPARING ACTIVITY:

NAVY - YD

(Project 5340-2022)

* INCH-POUND *

FF-S-2738
AMENDMENT-2
November 3, 1993

SUPERSEDING
AMENDMENT-1
31 January 1991

FEDERAL SPECIFICATION

SEALS, ANTIPILFERAGE

This amendment, which forms a part of FF-S-2738, dated June 7, 1990, is approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

Page 3

Paragraph 2.1.1

Federal Specifications: Delete "QQ-S-781 - Strapping Steel and Seals."
Military Standards: Delete "MS51938 - Seal, Metallic, Lead and Wire."

Paragraph 2.1.2

Other Publications: Add "ASTM D3953 - Specification for Strapping, Flat Steel and Seals."

Page 4

Paragraph 3.6.1.1, First sentence: Delete "type conforming to MS51938."

Change third sentence to read: " - - - -, two or 3 ply galvanized or stainless steel wire or copper wire as specified by the user."

Page 13

Paragraph 6.1, TYPE 9, change to read: "TYPE 9 - Car/Ball end seals may be utilized in applications requiring more than normal antipilferage security, and moderate physical strength."

Page 15

Line 21, under "Space five identifies shackle or wire material:"

Change: "4 Other" to read "4 Copper"
Add: "5 Other"

FSC 5340

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

FF-S-2738
Amendment-2

MILITARY INTERESTS:

Custodians

Army - AR
Navy - YD1

Review Activities

Army - ME
Navy - MC, SA, SH
Air Force - 99
DLA - IS
DNA - DS

CIVIL AGENCY COORDINATING ACTIVITIES:

GSA - 7FXE
NASA - MSF
ENERGY - DOE
POSTAL - USPS
TRANSPORTATION - OST
TREASURY - ATF, OAP
NSA - NS

PREPARING ACTIVITY:

Navy - YD1

(Project 5340-2159)