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MIL-C-81805(AS)
14 December 1970
Superseding AS-1077
15 July 1969

MILITARY SPECIFICATION

CARTRIDGE, IMPULSE, MARK 125 MOD 0

This specification has been approved by the Naval Air Systems Command, Department of the Navy.

1. SCOPE

1.1 This document governs the manufacture, assembly and preparation for delivery of the MARK 125 MOD 0 impulse cartridge and the methods of inspection and tests upon which product acceptance will be based.

2. APPLICABLE DOCUMENTS

2.1 The following specifications, standards, drawings, and publications, of the issue in effect on date of invitation for bids, form a part of this document to the extent specified herein.

SPECIFICATIONS

Military

MIL-P-116	Preservation, Methods of
MIL-D-21625	Design and Evaluation of Cartridges for Cartridge Actuated Devices
MIL-D-81303	Design and Evaluation of Cartridges for Stores Suspension Equipment

Naval Air Systems Command (Code Ident 30003)

AS-1075	Ignition Element, Electrical, MARK 14 MOD 0

FSC 1377

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STANDARDS

Military

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129	Marking for Shipment and Storage
MIL-STD-414	Sampling Procedures and Tables for Inspection by Variables for Percent Defective

DRAWINGS AND ASSOCIATED LISTS

Naval Air Systems Command (Code Ident 30003)

DL 2520046	Ignition Element, Electrical, MARK 14 MOD 0
DL 2838200	Cartridge, Impulse, MARK 125 MOD 0
2520046	Ignition Element, Electrical, MARK 14 MOD 0, Assembly
2838200	Cartridge, Impulse, MARK 125 MOD 0, Assembly
2838210	Cartridge, Impulse, MARK 125 MOD 0, Packaging Assembly
2838211	Container, Inner, Assembly

PUBLICATIONS

Bureau of Naval Weapons (Code Ident 10001)

OP 5	Ammunition Ashore (This publication is not furnished to bidders and contractors by the procuring activity. Contractors should contact the Government Inspector for use of the publication.)

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WR-43 Preparation of Quality Assurance Provisions

(Copies of specifications, standards, drawings, and publications required by contractors 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 document forms a part of this specification. Unless otherwise indicated, the issue in effect on date of invitation for bids shall apply.

CODE OF FEDERAL REGULATIONS

49 CFR 171-178 Transportation, Explosives and other Dangerous Articles

(Application for copies should be addressed to the Superintendent of Documents, Government Printing Office, Washington, D. C. 20402. Orders for the above publication should request the latest edition and supplements thereto.)

3. REQUIREMENTS

3.1 General.

3.1.1 The MARK 125 MOD 0 impulse cartridge covered by this specification shall be manufactured in accordance with the drawings listed on DL 2838200.

3.2 Materials. All materials used in the manufacture of the cartridges shall conform strictly with the specifications referenced on the respective Naval Air Systems Command drawings unless specific approval in writing covering a departure therefrom has been obtained from the Navy cognizant field activity for cartridges prior to manufacture. When alternate materials or methods of manufacture are specified on the drawings, the bidder's selections shall be clearly stated in the proposal.

3.2.1 Preproduction sample. Unless otherwise specified by the procuring activity, a preproduction sample of 192 MARK 125 MOD 0 impulse cartridges shall be manufactured using the same methods and procedures proposed for the production lot. The sample shall be tested as specified in 4.3.2 and is for the purpose of determining that the contractor, prior to starting production, is capable of producing items which comply with the technical requirements of the contract.

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3.3 Primary components. For the purposes of this specification, the Ignition Element, Electrical, MARK 14 MOD 0, Drawing 2520046; and the main propellant charge, Drawing 2838200; are defined as primary components. See 4.3.3.

3.3.1 Ignition element. The MARK 14 MOD 0 electrical ignition element used in the MARK 125 MOD 0 impulse cartridge shall be manufactured in accordance with the drawings listed on DL 2520046 and shall meet the applicable requirements of AS-1075. The ignition elements shall be from lots manufactured within the preceding 12 months. See 4.7.1.

3.3.2 Propellant charge.

3.3.2.1 Quantity. All propellant charges shall be as specified on Drawing 2838200. Charges shall be determined by weight rather than by volume measurements.

3.3.2.2 Smokeless powder, handling and loading. Do not subject smokeless powder to unnecessary handling or exposure to the atmosphere. The handling and loading of smokeless powder exposed to the atmosphere shall be performed only under conditions that do not permit the relative humidity to exceed 75 percent.

3.3.2.3 Smokeless powder, condition. The smokeless powder utilized shall exhibit no evidence of decomposition. See 4.7.2.

3.4 Cartridge inspection.

3.4.1 Visual inspection. Cartridges shall be free of the following visible defects: burrs, dents, deep scratches, split or cracked crimp, defective sealant application around crimp, chipped surfaces, or other defects which may prevent entry of the cartridge into the firing chamber, or affect the stability or resistance of the cartridge to moisture. See 4.7.4.

3.4.2 Bridge circuit resistance. The resistance of the bridge circuit in each completely assembled cartridge, when measured electrically as specified in 4.7.3, shall be not less than 1.0 ohm nor more than 1.2 ohms.

3.4.3 Leakage. Cartridge leakage rate shall not exceed 10^{-5} cc of air or gas per second when tested in accordance with 4.7.5.

3.5 No-fire. Each cartridge of the preproduction sample and each cartridge of the production lot ballistic and cartridge integrity samples shall meet the no-fire requirements of 4.8.

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3.6 Ballistic requirements. Cartridges from each production lot, selected in accordance with 4.9.1, shall meet the requirements listed below when subjected to the test prescribed in 4.9.2.

3.6.1 Velocity. The lower limit (L) of velocity shall be 16 ft/sec. See 4.9.2.1.1.

3.6.2 Misfire. There shall be no misfires. See 4.9.2.1.2.

3.6.3 Hangfire. There shall be no hangfires. See 4.9.2.1.3.

3.6.4 Propellant gas leakage. There shall be no propellant gas leakage. See 4.9.2.1.4.

3.7 Cartridge integrity. Cartridges from each production lot, selected in accordance with 4.9.1, shall exhibit no evidence of propellant gas leakage when subjected to the test of 4.9.3.

3.8 Change in propellant lot. Whenever a change occurs in the propellant lot, test firings shall be conducted in accordance with 4.11. No cartridge shall produce results outside the velocity limit of 3.6.1 and no cartridge shall fail to meet the requirements of 3.6.2 through 3.6.4.

3.9 Packaging, packing and marking. The packaging and packing of cartridges and the container markings shall be in accordance with Section 5. See 4.6.1.

3.10 Workmanship. Cartridges shall be constructed and finished in a manner to assure compliance with all requirements of this specification and applicable drawings.

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 supplies and services conform to prescribed requirements.

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4.2 Sampling. Unless otherwise specified, and when applicable, the sampling plans and procedures used in the determination of the acceptability of products submitted by a supplier shall be in accordance with the provisions of MIL-STD-414 or MIL-STD-105, whichever applies.

4.3 Lots.

4.3.1 Inspection lots. Inspection lot definition, formation, and size shall be in accordance with MIL-STD-414 or MIL-STD-105, whichever applies.

4.3.2 Preproduction sample. Before entering into quantity production, an acceptable preproduction sample of 192 cartridges shall be prepared. Of these cartridges, 182 shall be expended in the tests listed below and 10 shall be retained for investigative purposes. A preproduction sample acceptable for environmental and functional testing shall be defined as a sample which has met the requirements of paragraphs 3.1 through 3.4.3 and 3.10 of this specification. Preproduction sample acceptance shall consist of the no-fire test of 4.8, succeeded by the following tests as prescribed in Table 3 of MIL-D-81303, except for temperature and humidity cycling which shall be in accordance with Table 3 of MIL-D-21625: temperature and humidity cycling (18); vibration (12); 15 "g" shock (12); 40-foot drop (6); +70°F (12); -65°F (12); +200°F (12). Tolerance on temperatures shall be ± 5°F. Temperature conditioning prior to firing shall be for a minimum period of six hours. The numbers in parentheses denote the number of firings allocated for test, using two cartridges for each firing, except for the 40-foot drop which is a non-firing test. The above cartridge firings shall be conducted in an Aero 7A ejector rack as specified in 4.9.2. No cartridge shall produce results outside the velocity limit of 3.6.1 and no cartridge shall fail to meet the requirements of 3.6.2 through 3.6.4. Of the remaining cartridges, 20 shall be subjected to the cartridge integrity test of 4.9.3. The failure of any cartridge to meet the requirements as stated above shall cause rejection of the preproduction sample.

4.3.3 Production lot. Unless otherwise specified in the contract, the cartridge production lot size shall be 5000 minimum. Only primary components from a single lot shall be used in a production lot of cartridges; however, one primary component production lot may be used in more than one cartridge production lot.

4.4 Gages. The contractor shall provide gages as necessary to insure that the material to which this specification applies will meet the dimensional requirements shown on the applicable drawings.

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4.5 Classification of characteristics. The characteristics verified by the tests and examinations herein are classified as Critical, Major or Minor in accordance with WR-43. Tests and examinations that verify critical characteristics are identified by the symbol (C) and major characteristics by the symbol (M). The number following the classification symbol indicates the serial number of test or examination. Tests and examinations which are not annotated with a classification code are classified minor.

4.6 Quality conformance inspection. Quality conformance inspection shall consist of verification of the characteristics classified on the drawings of DL 2838200 and verification of the following requirements and tests:

Item	Nature of Requirement Verification	Applicable Paragraphs	Classification (WR-43)
Primary component	Single lot	3.3, 4.3.3	(M101)
Ignition element	Age and acceptance	3.3.1, 4.7.1	(C1)
Propellant charge	Type and weight	3.3.2.1	(C2)
Smokeless powder	Condition	3.3.2.3, 4.7.2	(C3)
Cartridge	Visual inspection	3.4.1, 4.7.4	(M102)
Cartridge	Bridge circuit resistance	3.4.2, 4.7.3	(C4)
Cartridge	Leakage	3.4.3, 4.7.5	(C5)
Cartridge	No-fire	3.5, 4.8	(C6)
Cartridge	Ballistics	3.6, 4.9.2	(C7)
Cartridge	Propellant gas leakage	3.6.4, 4.9.2.1.4	(M103)
Cartridge	Cartridge integrity	3.7, 4.9.3	(M104)
Cartridge	Ballistics (change in propellant lot)	3.8, 4.11	(C8)
Cartridge	Packaging, packing and container markings	3.9, 4.6.1	(M105)

4.6.1 Packing, packaging and marking. Quality conformance inspection shall be conducted in accordance with the inspection criteria on the applicable drawings referenced in Section 5.

4.7 Tests.

4.7.1 Ignition element, verification. Verification shall be provided that the ignition elements used were manufactured within the preceding 12 months and met the requirements of AS-1075.

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4.7.2 Smokeless powder, condition. Smokeless powder shall be inspected in accordance with the applicable paragraphs of OP 5. Evidence of decomposition shall be cause for rejection.

4.7.3 Bridge circuit resistance. Conformance with the bridge circuit resistance of 3.4.2 shall be ascertained on all completely assembled cartridges by means of a test circuit which limits the bridge circuit current to 25 milliamperes, maximum. A safety chamber with an interlock switch shall be used to protect the operator during the application of current. A suitable instrument which is known to be accurate within one percent in the range of resistance specified shall be used to determine whether or not the requirement is being met. Units which fail to meet the requirements of 3.4.2 shall be rejected. The results of bridge circuit resistance measurements shall not be affected by resistance of the test circuit and connector.

4.7.4 Visual inspection. Examine all cartridges visually and reject those having any of the defects of 3.4.1.

4.7.5 Leakage. Each cartridge in the preproduction sample and each cartridge of the production lot ballistic and cartridge integrity samples shall be leak tested in a dry gas or dry air leak tester. Cartridges which exhibit a leak rate in excess of 10^{-5} cc/sec gas or air at a pressure differential of 1.0 ± 0.1 atmosphere shall be considered defective. Cartridges of the preproduction sample which exhibit a leakage defect shall be rejected. If one or more cartridges of the ballistic sample or cartridge integrity sample exhibit a leakage defect, then a 100 percent leak test of the lot being tested shall be required at no additional expense to the government. Cartridges which exhibit a leak rate in excess of that specified above shall be rejected.

4.8 No-fire test.

4.8.1 Each cartridge of the preproduction sample and each cartridge of the production lot ballistic and cartridge integrity samples shall be conditioned for a minimum of six hours at +70° ± 5°F prior to testing. A current of 1.0 $^{+0.10}_{-0.00}$ amperes, regulated within an accuracy of one percent, shall be applied to each cartridge for a period of 5 $^{+0.1}_{-0.0}$ minutes. Any cartridge which fires shall be considered defective and shall cause rejection of the lot or sample represented. During this test, insure that the cartridge is sufficiently shielded to prevent personnel injury or material damage in the event a cartridge fires.

4.9 Ballistic and cartridge integrity tests.

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4.9.1 Sampling. A sample of cartridges for the ballistic test shall be selected from each production lot in accordance with Tables A-2 and B-1 of MIL-STD-414, Inspection Level IV, except that a double sample shall be required since two cartridges are used in each firing. In addition to the sample of cartridges for the ballistic test, 30 additional cartridges shall be furnished from each production lot. Of these cartridges, 20 shall be fired in the cartridge integrity test of 4.9.3 and 10 shall be retained for investigative purposes.

4.9.2 Ballistic test. After all cartridges of the sample under test have met the no-fire requirements of 4.8, the sample cartridges shall be reconditioned for a minimum of six hours at +70° ± 5°F and then fired in an Aero 7A ejector rack, mounted horizontally, ejecting a 500-pound inert store. The firing current shall be 10.0 ± 0.2 amperes, applied through a parallel circuit to the two cartridges. Instrumentation shall be provided to measure time from actuation of the firing circuit to first indication of store movement, or rack hook opening, and to measure store velocity for the first six-inch interval from end of ejector stroke.

4.9.2.1 Criteria of acceptability.

4.9.2.1.1 Store velocity. The lower (L) limit of store velocity shall be as specified in 3.6.1. With respect to store velocity, the lot shall be acceptable if the quantity $(\bar{X}-L)/s$ is equal to or greater than the appropriate value of k, at an AQL of 0.10, when computed in accordance with MIL-STD-414, Part I, Table B-1.

4.9.2.1.2 Misfire. The failure of any cartridge to fire shall result in rejection of the lot represented, unless such failure is plainly attributable to faulty test equipment or procedure.

4.9.2.1.3 Hangfire. One or more hangfires shall result in rejection of the lot represented. A hangfire is defined as a firing in which the elapsed time between actuation of the firing mechanism and first store movement or hook opening exceeds .025 second.

4.9.2.1.4 Propellant gas leakage. Evidence of propellant gas leakage by one or more cartridges, when examined in accordance with 4.9.3.1, shall cause rejection of the lot represented.

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4.9.3 Cartridge integrity test. A sample of 20 cartridges from each production lot and 20 cartridges from the preproduction sample shall be fired to test the ability of the cartridges to contain the propellant gases. After having met the no-fire requirements of 4.8, the cartridges shall be conditioned at +70° ± 5°F for a minimum period of six hours and fired in a closed test chamber. The test chamber shall have an internal volume, with a fired cartridge in place, of 2.00 ± .05 cubic inches, and the capability of withstanding an internal pressure of 30,500 pounds per square inch, minimum.

4.9.3.1 Criteria of acceptability. After firing, the ignition element end of each cartridge of the preproduction sample and each cartridge of the production lot ballistic and cartridge integrity samples shall be examined for evidence of propellant gas leakage through or around the ignition element. If one or more cartridges of the preproduction sample exhibit evidence of propellant gas leakage or fail to fire, the preproduction sample shall be rejected. If one or more cartridges of the production lot samples (ballistic or cartridge integrity) exhibit evidence of propellant gas leakage or fail to fire, the production lot shall be rejected.

4.10 Retest. There shall be no retests.

4.10.1 Test failure. If test failure is attributable to an assignable cause, excluding the test cartridges, the original test results should be discarded and that portion of the test reconducted.

4.11 Change in propellant lot. Whenever a change in propellant lot occurs, the charge weight shall be verified by firing 36 cartridges which have been temperature conditioned for a minimum of six hours (12 at -65° ± 5°F, 12 at +70° ± 5°F and 12 at +200° ± 5°F). Results of these firings shall meet the requirements of 3.8.

5. PREPARATION FOR DELIVERY

5.1 Preservation and packaging. For definitions of packaging levels, see 6.4.

5.1.1 Level A. Level A packaging shall be used for packaging of all production lots for service use. Sixty cartridges shall be packaged in an inner container in accordance with Drawing 2838211.

5.1.2 Level B. Not applicable.

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5.1.3 Level C. When directed by the procuring activity, those cartridges which are intended for expenditure in preproduction sample testing and for production lot acceptance tests shall be packaged in accordance with Method III of MIL-P-116 and with the Code of Federal Regulations 49 CFR 171-178.

5.2 Packing. For definitions of packing levels, see 6.4.

5.2.1 Level A. Level A packing shall be used for packing of all production lots for service use. Eight inner containers as described in 5.1.1 shall be packed in accordance with Drawing 2838210.

5.2.2 Level B. Not applicable.

5.2.3 Level C. When directed by the procuring activity, cartridges intended for expenditure in preproduction sample testing and for production lot acceptance tests and are packaged in accordance with 5.1.3 shall be packed to afford protection against damage during direct shipment from the supply source to the first receiving activity for immediate use. Shipping containers shall be in accordance with the Code of Federal Regulations 49 CFR 171-178.

5.3 Markings.

5.3.1 Special markings. Marking of exterior containers shall be in accordance with the Code of Federal Regulations 49 CFR 171-178.

5.3.2 Normal markings. Unless otherwise specified in the contract or order, the marking information on unit packages and shipping containers shall be as specified on Drawings 2838211 and 2838210, respectively. The specified marking information shall be applied to the containers in accordance with the applicable provisions of MIL-STD-129.

6. NOTES

6.1 Intended use. The MARK 125 MOD 0 impulse cartridge was originally designed to eject stores from aircraft.

6.2 Ordering information. Procurement documents should specify the following:

a. title, number and date of this specification;

b. whether preproduction inspection is required and, if so, specify the test activity;

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c. production lot size and test activity (see 4.3.3);

d. items of data required for each preproduction and production lot (see 6.3).

6.3 Data. For the information of contractors and contracting officers, any of the data specified in (a) subparagraphs below, (b) applicable documents listed in Section 2 of this specification or (c) referenced lower-tier documents need not be prepared for the Government and shall not be furnished to the Government unless specified in the contract or order.

6.3.1 Test report. Results of ballistic tests shall be forwarded to the Naval Air Systems Command (AIR-53222) and the procuring activity.

6.3.2 Data cards. The contract or order should state the format, quantity and destination of data cards.

6.4 Definitions. For the purposes of this specification, the following definitions apply.

6.4.1 Level A packaging. The degree of preservation and packaging which will afford adequate protection against corrosion, deterioration and physical damage during handling, shipment, indeterminate storage and world-wide redistribution.

6.4.1.1 Level C packaging. The degree of preservation and packaging which will afford adequate protection against corrosion, deterioration and physical damage during shipment from supply source to the first receiving activity for immediate use. This level may conform to supplier's commercial practice when such meets the requirements of this level.

6.4.2 Level A packing. The degree of packing which will afford adequate protection during shipment, handling, indeterminate storage and world-wide redistribution.

6.4.2.1 Level C packing. The degree of packing which will afford protection against damage during direct domestic shipment from the supply source to the first receiving activity for immediate use. This level in general will conform to applicable carrier rules and regulations and may be the supplier's commercial practice when such meets the requirement of this level.

6.5 Explosives safety precautions. Safety precautions for explosive-

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6.5.1 Applicability. The loading, assembly and handling of the explosives, explosive-loaded subassemblies and the finished items covered by this specification involve hazardous operations and therefore require suitable explosives safety precautions. At plants of the Naval Air Systems Command, Department of the Navy, and other Government plants where the Government is responsible for safety, the precautions listed in MIL-STD-1314 are mandatory. These same minimum provisions are recommended for observance by a contractor or manufacturer that explosively loads or assembles the item covered in this specification in order to fulfill his own safety responsibility.

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SPECIFICATION ANALYSIS SHEET

Form Approved
Budget Bureau No. 119-R004

INSTRUCTIONS

This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity *(as indicated on reverse hereof)*.

SPECIFICATION

MIL-C-81805(AS) CARTRIDGE, IMPULSE, MARK 125 MOD 0

ORGANIZATION *(Of submitter)*		CITY AND STATE
CONTRACT NO.	QUANTITY OF ITEMS PROCURED	DOLLAR AMOUNT $

MATERIAL PROCURED UNDER A

☐ DIRECT GOVERNMENT CONTRACT ☐ SUBCONTRACT

1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?

A. GIVE PARAGRAPH NUMBER AND WORDING.

B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.

2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID

3. IS THE SPECIFICATION RESTRICTIVE?

☐ YES ☐ NO IF "YES", IN WHAT WAY?

4. REMARKS *(Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)*

SUBMITTED BY *(Printed or typed name and activity)*	DATE

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