

MIL-W-13855D

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SUPERSEDING

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**MILITARY SPECIFICATION****WEAPONS: SMALL ARMS AND AIRCRAFT ARMAMENT SUBSYSTEMS,  
GENERAL SPECIFICATION FOR**

This specification is approved for use by all Departments and Agencies of the Department of Defense.

**1. SCOPE**

1.1 This specification covers general requirements for small arms weapons and aircraft armament subsystems, attachments, accessories, equipment, and parts and assemblies thereof, as applicable.

**2. APPLICABLE DOCUMENTS**

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

**SPECIFICATIONS**

<u>Federal</u> VV-L-800	-	Lubricating Oil, General Purpose, Preservative, (Water-Displacing, Low Temperature).
<u>Military</u> MIL-P-116	-	Preservation, Methods of.
MIL-D-1000	-	Drawings, Engineering and Associated Lists.
MIL-P-7788	-	Panels, Information, Integrally Illuminated.
MIL-A-8625	-	Anodic Coatings, For Aluminum and Aluminum Alloys.
MIL-P-16232	-	Phosphate Coatings, Heavy, Manganese or Zinc Base (For Ferrous Metals).
MIL-L-19538	-	Lacquer: Acrylic Nitrocellulose, Camouflage (For Aircraft Use).
MIL-I-45607	-	Inspection Equipment, Acquisition, Maintenance and Disposition of.

FSC 1005

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## STANDARDS

Federal  
Federal Test Method Standard Number 151 - Metals: Test Methods.

Military

MIL-STD-9	-	Screw Thread Conventions and Methods of Specifying.
MIL-STD-12	-	Abbreviations For Use on Drawings, Specifications, Standards and Technical Documents.
MIL-STD-100	-	Engineering Drawing Practices.
MIL-STD-105	-	Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-109	-	Quality Assurance Terms and Definitions.
MIL-STD-130	-	Identification Marking of U.S. Military Property.
MIL-STD-143	-	Specifications and Standards: Order of Precedence for the Selection of.
MIL-STD-171	-	Finishing of Metal and Wood Surfaces.

## DRAWINGS

U.S. Army Weapons Command

B7274018	-	Gage, File Test Specimen.
C7792555	-	General Data - Electrical.

## PUBLICATIONS

U.S. Army Weapons Command

PDS	-	Packaging Data Sheet
IEL	-	Inspection Equipment List.
SQAP	-	Supplementary Quality Assurance Provisions.

(As designated in the contract or order or applicable detail specification for the part or item being procured.)

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

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2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

American National Standard Institute

- |   |            |   |  |
|---|------------|---|--|
|   | ANSI-Y14.5 | - | Dimensioning and Tolerancing<br>for Engineering Drawings |
| * | ANSI-B46.1 | - | Surface Texture  |
| * | ANSI-Y32.3 | - | Welding Symbols  |

(Application for copies should be addressed to the American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, New York 10017.)

American Society for Testing and Materials

- ASTM - E 18 - Methods of Test for Rockwell Hardness  
and Rockwell Superficial Hardness of  
Metallic Materials

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

### 3. REQUIREMENTS

3.1 Precedence. Material covered by this specification shall conform to the requirements specified herein and those specified in drawings, specifications, and standards applicable to the specified item of procurement. Should any conflict exist between the requirements of the applicable documents, or between the contract and the applicable documents, the order of precedence shall be as follows:

- a. Contract.
- b. Drawings.
- c. Detail specifications for the item being procured.
- d. This specification.
- e. Detail specification for materials or operations.
- f. General specification pertaining to classes of materials or operations.
- g. Federal standards.
- h. Military standards.
- i. Other publications.
- j. Supplementary Quality Assurance Provisions (SQAP) shall be added for items not supported by a specification.

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- 3.2 First article. When specified (see 6.2), requirements for submission of first article shall be as specified in the detailed specification for the item, or in the procurement documents. The first article shall be representative of the production process to be used during quantity production of the entire contract. Unless otherwise specified (see 6.2), the first article shall include the pilot pack.

3.2.1 Manufacturing models. When specified in the procurement documents (see 6.2), the contractor shall proffer the specified number of completely assembled items of each type to be manufactured, before proceeding with quantitative manufacture. Each sample shall be marked for identification. Upon approval by the contracting officer, items of each type shall be returned to the contractor for use as a standard for general workmanship, functioning, appearance, finish and all other qualities for which definite requirements and tests are not prescribed. Samples retained by the Government during period of manufacturing shall be returned to the contractor in time to allow their inclusion in shipments under applicable contracts.

3.3 Materials. Materials (see 6.3.5) shall conform to the applicable specifications and drawings. No change or substitutions in materials shall be made without prior approval of the contracting officer.

3.3.1 Any material hammered, filed, or treated in any other manner to conceal defects therein, shall be subject to immediate rejection.

3.3.2 Material specified as "commercial quality" or prescribed by merely a name in general commercial use, such as "steel", "forged steel", "bronze", "cast iron", "brass", "drill rod", etc., will not ordinarily be subject to tests or analyses; however, the Government reserves the right to make such tests as it deems necessary to verify the quality of the material.

3.3.3 Castings. Castings shall not be used for fabrication of metallic parts unless specified on the drawings.

#### 3.4 Design.

3.4.1 Prescribed design. When contracts for items or parts of a prescribed design are awarded, the Government will furnish the contractor a set of drawings for use in manufacture. The contractor shall adhere to the design specified on the drawings, and in no case shall the drawings be scaled. Should drawing changes or interpretation to clarify any requirements of the drawings be desired by the contractor, application therefore shall be made through the contracting officer. All drawings furnished by the Government are for use of the contractor in the prosecution of Government work only.

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3.4.2 Contractor's design. Unless otherwise specified in the contract, when the contractor agrees to furnish items or parts for which the Government does not prescribe the design, the contractor shall prepare and submit to the contracting officer a complete set of drawings of the items or parts to be furnished. The drawings shall be prepared in accordance with MIL-D-1000.

3.4.3 New design. The maximum use of military standard parts, suitable items in the supply system and suitable commercial items shall be employed in development and design of new items to achieve the maximum benefits from the use of standards and standardization documents and prevent the unwarranted entry of a new item in the supply system. The order of precedence for the selection of specifications and standards to be used in design and construction of military material shall be in accordance with MIL-STD-143.

\* 3.4.4 Dimensioning and tolerancing. Definitions of terms and symbols used in specifying dimensions and tolerances shall be in accordance with ANSI-Y14.5. For phosphate coated parts, the dimensional and surface roughness provisions of MIL-P-16232 shall apply, and for anodized coated parts, the dimensional provisions of MIL-A-8625 shall apply.

3.4.4.1 When a drawing does not specify whether dimensions apply before or after application of a surface coating, the following interpretation shall be used:

\* a. Unless otherwise specified, dimensional limits and surface roughness designations shall apply after the application of inorganic finishes, except (see 3.4.4) for phosphated-coated parts. In the event of a dispute regarding dimensional compliance of phosphate-coated parts, the phosphate coating may be removed for the purpose of determining dimensional compliance.

b. Unless otherwise specified, where organic finishes, such as lacquers, varnishes, enamels, etc., are used, dimensional and surface roughness designations must be met prior to the application of the organic finish.

3.4.4.2 Concentricity and symmetry. Concentricity and symmetry shall be as specified on the applicable drawings. Where concentricity or symmetry are not specified on drawings, surfaces depicted as having a common centerline shall not be eccentric or unsymmetrical relative to each other by more than one half of the sum of the differences between the actual measured dimensions and the maximum material conditions specified by drawing dimensions. (Half the sum of the differences represents half of the allowable TIR.) All surfaces depicted in the same direction as the centerline without locational dimensions are considered to have a common centerline.

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- \* 3.4.4.3 Corners and edges. Unless otherwise specified on the drawings, all exterior edges and corners shall be broken with radii, or approximately  $45^{\circ}$  chamfers, of from 0.005 to 0.015 inch; all interior corners and edges shall be rounded with fillet radii from 0.005 to 0.015 inch; and other edges and corners shall be broken or rounded with radii, or approximately  $45^{\circ}$  chamfers, of from 0.005 to 0.15 inch. Chamfers shall be as defined in ANSI-Y14.5. (Corners and edges are defined in 6.3.5.)
- \* 3.4.5 Surface texture, surface roughness, waviness and lay. Definition of terms and symbols used in specifying surface texture, surface roughness, waviness and lay shall be in accordance with ANSI-B46.1.
  - 3.4.6 Interchangeability. Unless otherwise specified on the drawings, all parts of separable assemblies shall be interchangeable.
    - 3.4.6.1 Commercial repair parts. Repair parts specified by commercial designations shall be interchangeable with like parts currently in stock or service. If, for any reason, these parts are no longer manufactured, the contractor shall furnish the contracting officer a statement to that effect with information, including name and number, regarding the part he proposes to furnish. Each such part shall be interchangeable with the part originally specified and shall be approved by the contracting officer prior to acceptance. Where the part originally required is shown on a part drawing, the contractor shall furnish a drawing or drawings of the new part, giving the necessary information relative to the replacement for the part originally specified. When practicable, the above required information should be obtained from the bidder prior to award of the contract.
- 3.5 Construction.
  - 3.5.1 Manufacturing equipment. All necessary working gages, templets, dies, jigs, fixtures, and other equipment required for manufacturing shall be furnished by the contractor, except such as the Government may prefer to furnish (see 6.2).
  - \* 3.5.2 Joining operations. Unless otherwise specified, when parts are brazed, riveted, welded, press-fitted, pinned, staked or combined by any means into an assembly, or if an assembly is heat treated or protective finished, the parts of the assembly after any such operation shall be in accordance with dimensions specified on the respective part and prior assembly drawings, and applicable specifications.
    - \* 3.5.2.1 Welding and brazing. Definitions of symbols for welding and brazing shall be in accordance with ANSI-Y32.3.

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3.5.2.1.1 Welding. Joints shall be correctly prepared and welds shall show good fusion without dimensional or structural defects (i.e., warpage, incorrect weld size, incorrect weld profile, porosity, non-metallic inclusions, incomplete penetration, undercutting, cracking, surface defects).

3.5.2.1.2 Brazing. Brazing materials shall be controlled to prevent spreading over adjacent surfaces. Unless otherwise specified, a fine line of brazing material shall be visible at the joints.

\* 3.5.2.2 Rivets and riveting. Unless otherwise specified on the drawings, all rivets shall be driven in place, shall be tight and shall completely fill the rivet holes. Heads of rivets shall be full form without excess metal and concentric with rivet body, within good industrial practice. Loose, burned, malformed, or otherwise defective rivets shall not be allowed. Surfaces and sections that are not riveted together to make a rigid assembly shall make good contact with each other. After riveting, the joined parts shall be undamaged and shall show no relative movement of parts. Parts joined by riveting to make a flexible assembly (e.g., where a rivet serves as a pivot for moving parts within the assembly) shall be undamaged after riveting, shall be retained in the assembly, and shall allow movement of parts through their full range of travel.

3.5.2.3 Fastening devices. All screws, pins, bolts and similar parts shall be installed in such a manner to prevent loss of tightness without damage to screw threads or attached parts. When special securing means are required, they shall be in accordance with applicable drawing.

3.5.3 Heat treatment. Unless otherwise specified on the drawings, heat treatment methods indicated thereon are for guidance, except that time at temperature shall not be reduced below that specified on the part drawing. Heat treating methods and processes shall be in accordance with the highest grade practice used in manufacturing military weapons. Heat treatment shall be applied uniformly throughout the part, and the methods, control, and equipment used shall produce the physical properties and hardness requirements specified on the drawings, without causing injurious decarburization or scaling and shall not result in excessive coarseness, overheated, improperly quenched or tempered material.

3.5.3.1 Whenever the recommended heat treatment calls for a carburizing treatment, the use of the straight cyanide bath or carbonitriding process will not be permitted without the prior approval of the responsible Government technical agency through the contracting officer.

3.5.4 Mechanical properties. The abbreviations used in the "Mechanical Properties" block on drawings are interpreted in MIL-STD-12.

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3.5.4.1 Unless otherwise specified on the drawings, hardness requirements shall apply on all surface areas of the parts. When specific locations for hardness tests are indicated, tests may be made on additional areas to determine uniformity of heat treatment.

3.5.4.2 Hardness requirements shall be checked by using the hardness scale specified on the component drawing or assembly drawing.

3.5.4.3 Except where otherwise noted, hardness limits apply to tests made on sufficiently smooth, flat, and properly supported surfaces. Hardness tests made under other conditions may be used only when necessary if results are compensated for the error introduced by such conditions. Test methods for determining the Rockwell hardness and Rockwell superficial hardness of metallic materials shall be in accordance with ASTM E18.

3.5.4.4 Case hardness depth requirements. Unless otherwise specified, the case hardness depth requirements shall be defined as follows:

3.5.4.4.1 Total case depth. This shall be defined as the perpendicular distance from the surface of the case down through the entire portion of carbon enrichment.

3.5.4.4.2 Effective case depth. This shall be defined as the perpendicular distance from the surface of the case to a point where the hardness is equivalent to Rockwell C50.

\* 3.5.4.4.3 File hard. When the term "file hard" is used, it indicates a requirement for a hard, wear-resistant surface on thinly case hardened parts (minimum hardness of approximately Rockwell C60). Testing for file hardness shall be in accordance with 4.5.6.

3.5.5 Protective finishes. Unless otherwise specified, the exterior surfaces of individual weapons, crew served ground weapons, or other weapons applications, where reflective surfaces would be detrimental to combat employment of the item, shall be dull, non-reflective, corrosion resistant, and black or approaching black in color. Exterior surfaces of weapons and parts used in aircraft weapons subsystems may not require dull non-reflective surface if they are inclosed in a pod or contained inside the aircraft. However, consideration must be given to objectionable reflective surfaces inside of the cockpit and to disassembly for cleaning or repair in a combat area where reflection could be a hazard.

3.5.5.1 Where no protective finish is specified, natural finish of the material or the finish obtained from heat treatment is permissible, provided that surfaces are free of scale and corrosion.



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3.5.5.2 Preparation, painting, and finishing of metal and wood surfaces shall be in accordance with MIL-STD-171. Unless otherwise specified on the component drawing, the following shall apply to the phosphating and oxidizing processes:

a. Phosphate-coated parts and black oxide parts shall be rinsed as prescribed in the applicable specification. On emergence from the prescribed rinse, parts shall be thoroughly dried before applying the supplementary preservative. Unless otherwise authorized, drying shall be accomplished by the use of drying ovens, heated forced air circulation, or filtered compressed air. The drying temperature shall not exceed 200° F.

b. The supplementary preservative for black oxide coatings shall conform to VV-L-800.

c. No carry over of residues from the phosphating solutions to the supplementary preservative oil shall be permitted. Periodic tests of the oil shall be made at least semi-monthly to insure that the oil continues to meet specification requirements for corrosion protection.

d. The Springfield Immersion Test specified in MIL-P-16232 is authorized for use for accelerated corrosion testing of phosphate-coated parts.

3.5.5.3 Touch-up procedures. The materials, procedures and systems prescribed herein, and in Table I may be used in lieu of refinishing with the original specified finish for restoration of small areas of finishes which are damaged or otherwise removed as a result of fabrication or assembly operations. Unless otherwise specified, this touch-up procedure shall not apply to functional areas or areas that will be immersed in oil or grease. Touch-up shall not be used as a means of concealing poor workmanship.

\* 3.5.5.3.1 Materials. All materials used in the refinishing procedure shall conform to the requirement of the applicable specification. Should it be determined that a material, procedure or system, other than that specified herein is necessary or more suitable, such material, procedure or system may be used only upon approval by the contracting officer.

3.5.5.3.2 Surface condition. The area to be touched-up shall be free from soils and corrosion products such as grease, oil, solder flux, welding flux, rust, scale or other foreign material that might interfere with the intimate application of the finish. The area to be touched-up shall be cleaned immediately before the refinishing operation and shall be accomplished by wiping with a clean lint-free cloth saturated with an oil free solvent that will not harm the original specified finish.

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TABLE I

## Touch-Up (Refinishing) of Metal Surfaces

<u>Original Specified Finish, MIL-STD-171</u>	<u>Touch-Up (Refinishing) Schedule</u>
1.1.2 or 1.1.3	* 6.4.2 + Lacquer, MIL-L-19538: Colorless
1.2 through 1.2.5	* Lacquer, MIL-L-19538: Colorless
3.2	* Lacquer, MIL-L-19538: Color: Flat Black, No. 37038
3.3	* Lacquer, MIL-L-19538: Color: Flat Black, No. 37038
4.1, 4.4 with All Paint Systems	* Lacquer, MIL-L-19538: Color: As Applicable
4.3 + 20.8	* Lacquer, MIL-L-19538: Color: As Applicable
5.1.1, 5.1.2 or 5.2 with All Paint Systems	* Lacquer, MIL-L-19538: Color: As Applicable
5.3 All Finishes	* Lacquer, MIL-L-19538: Color: Flat Black, No. 37038
7.1.1, 7.2.1, 7.3 series or 7.5 <sup>1</sup> (Non-Dyed)	Brush Applied 7.3 series Colorless
7.1.2 or 7.2.2 (Dyed)	Brush Applied 7.3 series * + Lacquer, MIL-L-19538: Color: As Applicable
7.1.1, 7.2.1, 7.3 series or 7.5 <sup>1</sup> with Primer	Brush Applied 7.3 series + Original Primer
7.1.1, 7.2.1, 7.3 series or 7.5 <sup>1</sup> + Specified Primer with All Paint Systems	Brush Applied 7.3 series + Original Primer + Original Paint
20.1 through 24.5	Original Specified System

<sup>1</sup>Touch-up for finish 7.5 shall not be used on surfaces subjected to wear. These surfaces shall be reprocessed.

3.5.5.3.3 Touch-up coating. The touch-up coating shall be lusterless, have uniform and satisfactory hiding power, and be approximately the color of the surrounding surface. The touch-up coating shall be smooth and free of excessive material, runs or other imperfections and shall show good adhesion to basic material and to paint coatings as applicable. Unless otherwise specified, the touch-up of any paint system shall consist of only the top coat or coats of original paint.

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3.5.5.3.3.1 When spray lacquer is specified, it may be dispensed into a suitable container and applied by brushing in difficult or confined areas.

3.5.5.3.3.2 When touch-up is required for the manufactured head or upset head of rivets, the finish of the surrounding surface shall be considered the original finish specified and the touch-up schedule for that finish shall be applied to the rivets.

3.5.5.3.3.3 The total area covered by the touch-up materials shall not exceed approximately twice the damaged area to which it is applied.

3.5.5.3.4 Refinishing of edge lit plastic panels (MIL-P-7788). If the mar or scratch penetrates both the black outer finish and white under coat, the following touch-up procedure shall be utilized: touch-up the bare surface with a fine brush using white vinyl lacquer (Dennis Chemical Company #2760 or equal), and when dry cover all white lacquer with black vinyl lacquer (Dennis Chemical Company #2761 or equal) brush applied. If mar or scratch penetrates only the black outer finish, use the brush applied black vinyl lacquer (Dennis Chemical Company #2761 or equal).

\* 3.5.6 Screw threads. Unless otherwise specified on the drawings, screw threads shall be in accordance with MIL-STD-9.

3.5.7 Aircraft armament electrical wiring. The requirements for the wiring of electrical and electronic assemblies for aircraft armament subsystems shall be in accordance with Drawing C7792555 unless otherwise specified.

3.5.8 Compatibility of dissimilar metals. Intermetallic contact of various metals shall be in accordance with the general requirements for compatibility of dissimilar metals and reduction of corrosion at intermetallic contact points shall be as specified in MIL-STD-171, or as specified on the applicable drawings.

3.6 Marking. Each item and part for which markings are specified shall be clearly marked in the positions and type sizes indicated on the applicable drawings in accordance with MIL-STD-130.

3.6.1 Serial numbers. Blocks of serial numbers applicable to weapons being procured will be assigned to the contractor for each contract (see 6.2). When a serial number is not assigned by the procuring agency, the manufacturer's serial number shall be entered, if the manufacturer employs a serial number system. Application of serial numbers to weapons will be in accordance with MIL-STD-130.

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3.6.2 Manufacturer's identification. Wherever practicable, parts furnished by the prime contractor shall be marked as specified in MIL-STD-130 with his code identification number. If parts are furnished by a subcontractor, it is permissible to include the subcontractor's code identification number or registered trade mark, provided such marks are desired by the prime contractor. All manufacturer's marks shall be subject to the approval of the contracting officer.

3.6.3 Heat, melt, or lot identification. For material and parts to be tested for physical qualities or chemical composition, the contractor's system of marking shall be such as to enable the inspector to positively identify any or all portions of each heat, melt, or lot.

3.6.4 Department of Defense inspection approval stamp. When specified in the item specification or other applicable documents listed in the contract, items which have passed all examinations after successful completion of testing shall be stamped by the contractor with the Department of Defense complete inspection approval stamp (specify location of stamping if applicable). The Government representative will control the stamps used for such stampings to assure successful completion of all required examinations and tests.

### 3.7 Assembled items.

3.7.1 Parts or items disassembled in connection with examinations, tests, or preparation for delivery shall be reassembled using parts originally contained therein.

3.7.2 Assemblies and subassemblies containing moving parts shall function as intended.

\* 3.8 Workmanship. Workmanship and finish shall be in accordance with the highest grade practice used in manufacturing military weapons. Finished items and parts shall not exhibit poor material and processing such as seams, laps, laminations, cracks, visible steps, sharp edges, nicks, scratches, burrs, deformations and missing operations which may affect serviceability, functioning, operation, appearance or safety. Fins and other extraneous metal shall be removed from cast or forged parts. Hammering to shape, salvage operations (including repair by welding) or other similar practices shall not be permitted without prior approval of the contracting officer.

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#### 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.

4.2 Quality assurance terms and definitions. Inspection terms and definitions used herein are in accordance with MIL-STD-109. Whenever the term "inspector" is used herein, it denotes Government representative.

4.3 Sampling. Sampling inspection of each lot shall be performed in accordance with MIL-STD-105, utilizing the classification of defects in the applicable document. The Government reserves the right to inspect every unit or product and to inspect for any requirement, whether or not it is listed in a classification of defects. In such cases, rejection on a lot basis is not proposed, and items and parts will be rejected individually.

4.3.1 Inspection lots. Lot sizes shall be in accordance with applicable detail specifications. Items and parts not covered by detail specifications shall be submitted for inspection in lot sizes satisfactory to the inspector. A lot shall be as large as practicable in consideration of quality history, manufacturing conditions, and contractor's delivery schedule. Unless otherwise specified, a lot of parts shall consist of:

a. Parts made from one lot of raw material, unless physical characteristics have been previously checked on a heat-treat lot or batch basis, in which case a lot may contain parts made from more than one lot of raw material. A heat-treat lot or batch shall be limited to one material lot.

b. Parts made from one manufacturing process. In general, lots of assembled parts need not agree with material lots but shall be dependent on changes in manufacturing processes affecting chemical or physical characteristics or dimensions.

c. A collection of units of products manufactured or packaged under essentially the same conditions and submitted for inspection at one time.

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4.3.2 Examination samples. Unless otherwise specified, sample sizes for examination shall be in accordance with MIL-STD-105.

4.3.3 Test samples. Test samples shall be selected in accordance with applicable drawings, specifications, and other documents or as specified in the contract. Sampling for packaging tests shall be conducted in accordance with MIL-P-116. Sampling for cleanliness tests shall be performed on lots of parts or items rather than on lots of packages.

\* 4.4 Examination. Manufacturing models and designs shall be examined as necessary to insure compliance with Section 3. Production parts shall be examined as necessary to assure compliance with drawing requirements and with the dimension, construction, protective finish, and marking and identification requirements of Section 3. Items shall be visually examined for completeness of manufacture, assembly, finish and workmanship. When doubt exists concerning acceptability of the contractor's workmanship, the questionable physical items shall be forwarded to the responsible technical agency for decision. Barrel chambers and bores shall be examined for rust, pits, powder fouling, burrs, and other defects. Items having movable parts shall be operated by hand to ascertain that the final adjustments have been made to assure proper operation. Before final acceptance of any lot, the inspector shall make whatever final inspection deemed necessary to assure that items and parts have undergone all examinations and tests prescribed therefor, and that items and parts have been thoroughly cleaned and prepared for shipment as required by Section 5 and by other applicable documents.

#### 4.5 Tests

4.5.1 Materials, parts, and items shall be tested as necessary to insure compliance with the requirements of Section 3, and with detail item specifications or other applicable documents as listed in the contract. When test methods and procedures are not specified in detail specifications or other applicable documents, they shall be in accordance with the applicable provisions of this specification.

4.5.2 Unless otherwise specified, all testing of materials, parts, and items, and the handling, sampling, preparation of test specimens, chemical analysis, and other operations necessary for such testing, shall be done by the contractor under the surveillance of the inspector.

4.5.3 Unless otherwise specified, all samples, specimens, parts, and items (including those expended in reliability tests) destroyed in making tests required by detail specifications to determine compliance therewith shall be in addition to the quantity specified in the procurement documents, and shall be furnished as part of the order or contractual agreement.

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4.5.4 Test of metals. Unless otherwise specified, all tests of metals shall be made in accordance with Federal Standard 151. The number and location of test specimens when not prescribed in the contract, on the drawings, or in detail specifications, shall be determined by the inspector. Specimens shall be so taken as to fairly represent the applicable piece or lot. Where determined practicable, test specimens taken from one or more pieces shall represent the lot. The lot shall be accepted or rejected on the basis of the test results.

4.5.5 Protective finish tests. The use of panels shall not be allowed unless authorized by the contracting officer. Scrapped parts of recent manufacture may be used provided they are processed concurrently with, and in the same manner as, normal production parts of the same likeness.

- 4.5.6 File hardness test. A 6 inch #0 Swiss Pattern Pillar Testing File of Rockwell C65 minimum hardness is used to test for this requirement. The unworn flat cutting surface of the file shall be placed on an edge or curved surface of the part being tested. While applying a three to five pound force perpendicular to the flat surface of the file, the part is given a very short stroke (not exceeding 1/4 inch) by the test file. The part shall be considered file hard if the sticking or cutting action of the file is the same or less than that obtained when the file is used on a Rockwell C60 test prover (Drawing BT274018) or a test piece hardened to Rockwell C60. The inspector should develop a "feel" for this test by practicing it on test provers or test pieces of known hardness.

4.5.7 Concurrent repair parts interchangeability test. At least two of the items previously tested for interchangeability in accordance with the applicable detail item specification, disassembled as before, shall be reassembled using repair parts being concurrently procured with the item. There shall be no hand refinement, and the items shall operate and function properly. This test may be performed independently of the item interchangeability test and at more frequent intervals, using accepted items taken from current production.

4.6 Rejection, reinspection, and retests. No allowance will be made to the contractor for time consumed in reconditioning, or retesting of materials, parts, or items.

4.6.1 Firing retests.

4.6.1.1 Misfires. If misfires occur during firing tests on weapons, the weapon concerned shall be subjected to appropriate examination and tests to determine whether the weapon is at fault. Weapons responsible for such malfunctions shall not be accepted until corrected.



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4.6.1.2 Malfunctions not attributable to item. Malfunctions in any test assignable to improper linking of ammunition, improper feeding of ammunition to the item, or defective ammunition, links, clips or magazines (when not considered part of the weapon or weapon system), test equipment or other similar equipment, shall not count against the item being tested.

- \* 4.7 Inspection equipment. Government prescribed inspection equipment required for use to determine product compliance with established requirements will be designated on the applicable Quality Assurance Inspection Equipment List (IEL) (see 6.2). Use of contractor inspection equipment, when desired by the inspector, shall be permitted without charge. Unless otherwise specified, responsibility for acquisition, maintenance, and disposition of measuring and testing equipment shall be in accordance with MIL-I-45607.

4.7.1 Ammunition and small arms items and parts. Unless otherwise specified (see 6.2), ammunition for all testing, including a reasonable additional amount for normal retesting as determined by the contracting officer (approximately 10 percent) will be furnished by the Government without cost to the contractor. However, the contractor shall bear the cost of ammunition used in testing to determine the quality of deviating material, small arms or subsystem items, and parts other than those being manufactured by the contractor, required for examination and tests, will be furnished by the Government.

## 5. PREPARATION FOR DELIVERY

- \* 5.1 Pilot Pack. The pilot pack shall consist of items or parts packaged in accordance with the applicable packaging data sheet (PDS) or packaging instructions cited on applicable list of drawings and specifications, or in accordance with the contract for the level of protection specified in the contract (see 6.2), packed level C and forwarded in accordance with 3.2.
- \* 5.2 Preservation, packaging, packing and marking. Items and parts shall be preserved, packaged, packed and marked in accordance with the applicable Packaging Data Sheet (PDS) or Packaging instructions cited on applicable list of drawings and specifications, or in accordance with the contract, for the level of protection specified in the contract (see 6.2).

## 6. NOTES

6.1 Intended use. This specification may be used either wholly or in part in the manufacture and inspection of military weapons and weapon system items and parts being procured by the Government.



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6.2 Ordering data. Procurement documents should specify the following:

- a. A list of applicable drawings and specifications pertinent to the item or part on order, showing applicable revision dates.
- b. Block of serial numbers when required (see 3.6.1).
- \* c. Requirements for first article (see 3.1) and pilot pack (see 5.1), if required.
- d. When manufacturing models are required (see 3.2.1).
- \* e. Applicable packaging data sheet or packaging instruction and level of packaging required (see 5.1).
- f. Place of inspection (see 6.3.1).
- g. Responsibilities for furnishing ammunition and small arms items, if different (see 4.7.1).
- h. Responsibilities for furnishing manufacturing, inspection, and test equipment (see 3.5.1 and 4.7).
- i. Responsibility for supply, maintenance, and disposition of acceptance inspection equipment prescribed on approved Inspection Equipment Lists (see 4.7).

### 6.3 Miscellaneous notes.

6.3.1 Place of inspection. Unless otherwise deemed necessary, inspection and tests should be performed at the plant of the prime contractor (see 6.2).

6.3.2 Notification and information. As soon as practicable after receiving an order, the contractor shall inform the inspector when work will be started, and of the general plans and methods he intends to follow. When action by a testing agency is required, work programming will be effected with the testing agency at the earliest practicable date. During the progress of the work, the contractor shall furnish the inspector the following information:

- a. Notification of the time when each operation the inspector is required to witness is to take place, sufficiently in advance to enable the inspector to be present.
- b. Such other notifications as may be required to insure that the inspector has the opportunity to witness any particular portion of any operation previously indicated by the inspector.
- c. When required, certified reports of tests for materials and processes and statements of compliance with applicable documents.

6.3.3 Interpretation. Any doubt as to the meaning of this specification, or any obscurity in its wording, will be explained, and all directions and explanations necessary or proper to make more definite and certain any of the provisions of the specifications and give them due effect will be given by the contracting officer.

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6.3.4 Confidential agreement. If the contractor so desires and so notifies the contracting officer through the inspector, the details of the contractor's operations will be held as confidential by the Government.

6.3.5 Definitions. For the purposes of this specification the following words and terms are defined:

- a. Corner. An intersection of edges.
- b. Edge. A line of division bounded by two surfaces.
- c. Exterior corners and edges. Corners and edges having included angles less than  $180^\circ$  (measured through the material).
- d. Interior corners and edges. Corners and edges having included angles greater than  $180^\circ$  (measured through the material).
- e. Item. A complete subsystem, weapon, accessory, attachment, or related equipment.
- f. Material. Raw material.
- g. Part. A component or assembly forming part of an item.
- h. Surveillance. Surveillance is not intended to mean continuous observation by an inspector. Adequate control of performance can be effected by frequent and unexpected spot checks of tests and processes.

6.4 When warranted, one of the following paragraphs should be included in the contract or order to specify the type of quality program or inspection system that is required for the contract or order on the Management Control Systems Summary List, DD Form 1660:

- a. Contractor's quality program requirements. The contractor shall provide a quality program in accordance with MIL-Q-9858.
- b. Contractor's inspection system requirements. The contractor shall provide and maintain an inspection system in accordance with MIL-I-45208.

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- \* 6.5 Unless otherwise specified (see 6.1h), the contract should specify the application of MIL-I-45607 and MIL-C-45662 on the Management Control Summary List, DD Form 1660.

6.6 The margins of this specification are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Custodians:

Army - WC  
Navy - OS  
Air Force - 84

Preparing activity:

Army - WC

Project No. 1005-0448

Review activities:

Navy - OS, AS, MC  
Air Force - 84

## STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

*(See Instructions - Reverse Side)*

1. DOCUMENT NUMBER

2. DOCUMENT TITLE

3a. NAME OF SUBMITTING ORGANIZATION

4. TYPE OF ORGANIZATION (Mark one)

 VENDOR USER MANUFACTURER OTHER (Specify): \_\_\_\_\_

b. ADDRESS (Street, City, State, ZIP Code)

## 5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

## 6. REMARKS

7a. NAME OF SUBMITTER (Last, First, MI) - Optional

b. WORK TELEPHONE NUMBER (Include Area Code) - Optional

c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional

8. DATE OF SUBMISSION (YYMMDD)

DD FORM 1426  
82 MAR

PREVIOUS EDITION IS OBSOLETE.

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