OFFICE OF THE ASSISTANT TO THE SECRETARY OF DEFENSE
1400 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-1400

PUBLIC AFFAIRS

Ref: 94-F-1578

26 AUG 1994

Ms. Judith Altenberg
Piper and Marbury
1200 Nineteenth Street, N.W.
Washington, D.C. 20036-2430

Dear Ms. Altenberg:

This responds to your July 13, 1994, Freedom of Information Act (FOIA) request pertaining to defense procurement programs. Our July 29 interim response refers.

The Environmental Security Office, Deputy Undersecretary of Defense, has provided the enclosed memo and documents as responsive to your request.

Due to the size and complexity of the DoD, there is no central repository for all DoD records. This Directorate is responsible for responding to requests for records of the components of the Office of the Secretary of Defense and the Joint Staff (OSD/JS). The several components of the DoD, including the military departments and separate defense agencies, operate their own Freedom of Information offices to respond to requests for records for which they are responsible. These procedures are provided in DoD Regulation 5400.7-R, as published at 32 CFR 286. If you desire additional information pertaining to concrete fly ash and such, you may write to the following addresses:

Commander
Naval Facilities Engineering Command
Code 09CP
200 Stovall Street
Alexandria, VA 22332-2300

Office of the Chief of Engineers
ATTN: CECC-K
Room 8218, Pulaski Building
20 Massachusetts Ave, N.W.
Washington, D.C. 20314-1000

Pursuant to the Reform Act, as promulgated by DoD Regulation 5400.7-R, your request has been categorized as commercial in nature. Commercial requesters are obligated to pay search, review, and reproduction costs associated with their requests. Established DoD fees are: clerical search or review, $12 per hour; professional search or review, $25 per hour; executive review, $45 per hour; computer search, varies according to the system used, billed per minute; microfiche, $0.25 per page;

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office copy reproduction, $0.15 per page; and printed publications or reports, $0.02 per page.

The total cost of processing your request was $66.80 of which $60.55 is assessable. This amount is derived from 1 1/2 hours of search and 1/4 hour of review at the professional rate, 97 pages reproduced, and 425 pages of printed reports.

Please indicate the reference number, **94-F-1578**, on a check or money order made payable to the U.S. Treasurer in the amount of **$60.55**. Send the payment within 30 days to this office at the address indicated below:

OATSD(PA)
DFOISR
Room 2C757
1400 Defense Pentagon
Washington, DC 20301-1400

Sincerely,

W. M. McDonald
Director
Freedom of Information
and Security Review

Enclosures:
As stated

OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON
WASHINGTON DC 20301-3000

ACQUISITION AND TECHNOLOGY

DUSD(ES)/PP

23 AUG 1994

Piper & Marbury
1200 Nineteenth Street NW
Washington, DC 20036-2430

Gentlemen:

Please refer to your letter of July 13, 1994, containing a Freedom of Information Act Request on the Department of Defense affirmative procurement program. I am pleased to be able to partially grant your request for information as follows (order corresponds with that in your letter):

- The DoD affirmative procurement program for EPA designated items is being developed. We have sought to comply with the statutory provisions of the law by encouraging the procurement of items with recycled content and have demonstrated our overall concern with environmental matters by creating the position of Deputy Under Secretary of Defense (Environmental Security) to oversee the Department's environmental activities. We are formalizing an affirmative procurement program for the five designated EPA guideline items and expect to issue guidance by September 30, 1994.

- No additional (or alternative) affirmative procurement programs have been developed by DoD's inter-service committee chartered under the Defense Environmental Policy Council.

- The DoD single environmental directive as referenced in the 1992 OFPP report has not been developed.

- The 1992 and 1993 reports provided to OFPP under RCRA, section 6002, are enclosed.

- Two documents (MILSTD 961C and 962B) eliminating the exclusion of the use of recovered materials are enclosed.

- A representative DoD specification for cement and concrete containing fly ash is enclosed. The specifications relating to fly ash are spread throughout the documentation on cement and concrete and are quite voluminous and are not available from this office.

I trust that the above is responsive to your needs for information on the status of the DoD affirmative procurement program.

Sincerely,

Gary D. Vest
Principal Assistant Deputy Under Secretary
of Defense (Environmental Security)

ASSISTANT SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301-8000

February 3, 1993

RODUCTION AND
LOGISTICS

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
UNDER SECRETARY OF DEFENSE (POLICY)
DIRECTOR, DEFENSE RESEARCH AND ENGINEERING
ASSISTANT SECRETARIES OF DEFENSE
COMPTROLLER
GENERAL COUNSEL
INSPECTOR GENERAL
DIRECTOR, OPERATIONAL TEST AND EVALUATION
ASSISTANTS TO THE SECRETARY OF DEFENSE
DIRECTOR, ADMINISTRATION AND MANAGEMENT
DIRECTORS OF THE DEFENSE AGENCIES

SUBJECT: Preference for Recycled Paper

Executive Order 12780 and §6002 of the Resource Conservation and Recovery Act require Federal agencies to establish preference programs for purchasing paper and paper products made with recycled materials. To comply with these documents and meet our responsibilities, it is Department of Defense policy to:

- Specify and purchase only paper and paper products containing recycled materials consistent with Environmental Protection Agency (EPA) Procurement Guidelines (40 CFR Part 250)

- Require all reports (or other paper products) produced by or for the Department be consistent with the EPA Guidelines (40 CFR Part 250)

- Require paper deliverables contain recycled materials.

- Order only letterhead stock containing recycled materials and request that it so indicate with a recycling logo and "*Printed on Recycled Paper*". Please exhaust existing supplies.

- Require all documents longer than two pages be double-sided copied.

- Make maximum use of General Services Administration schedules for paper and paper product procurements pursuant to DFAR Subpart 208.404.

****

DEPARTMENT OF THE NAVY
NAVAL FACILITIES
ENGINEERING COMMAND
GUIDE SPECIFICATION

NFGS-03300J
30 June 1994

Superseding NFGS-03300H

****

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DEPARTMENT OF THE NAVY
NAVAL FACILITIES
ENGINEERING COMMAND
GUIDE SPECIFICATION

NFGS-03300J
30 June 1994

Superseding NFGS-03300H

****

NFGS-03300J

CAST-IN-PLACE CONCRETE

****

Preparing Activity: LANTNAVFACENGCOM

	Typed Name & Reg.	Signature	Da
Prepared by:	R. M. Jackson, P.E.	/s/	05/
Approved by:	M. D. Mutter, P.E. Branch Manager	/s/	05/
Approved by:	W. H. Crone, P.E. Division Director	/s/	05/
Approved for NAVFAC:		/s/ Carl E. Kersten, R.A.	06/

****

AMSC N/A A

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DEPARTMENT OF THE NAVY
NAVAL FACILITIES
ENGINEERING COMMAND
GUIDE SPECIFICATION

NFGS-03300J
30 June 1994

Superseding NFGS-03300H

****

SECTION 03300

CAST-IN-PLACE CONCRETE
06/94

****

NOTE: This guide specification covers requirements for cast-in-place concrete. For projects of 50 cubic yards of concrete and less, where minimal formwork is required, use Section 03302, "Cast-In-Place Concrete (Minor Building Construction)."

****

****

NOTE: This revision "J" to NFGS-03300 updates the references and paragraphs in text, and revalidates the issue dated 31 March 1994.

****

****

NOTE: See Note A located at rear of text.

****

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to extent referenced. The publications are referred to in the text b basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M182	1990 (R 1991) Burlap Cloth Made from or Kenaf

AMERICAN CONCRETE INSTITUTE (ACI)

ACI 117	1990 Tolerances for Concrete Constru and Materials
ACI 211.1	1991 Selecting Proportions for Norma Heavyweight, and Mass Concrete
ACI 211.2	1991 Selecting Proportions for Struc Lightweight Concrete
ACI 213R	1987 Structural Lightweight Aggregat Concrete
ACI 301	1989 Structural Concrete for Buildin

ACI 302.1R	1989 Concrete Floor and Slab Constru
ACI 304R	1989 Measuring, Mixing, Transporting Placing Concrete
ACI 304.2R	1991 Placing Concrete by Pumping Met
ACI 305R	1991 Hot Weather Concreting
ACI 306.1	1990 Cold Weather Concreting
ACI 315	1980 (R 1988) Details and Detailing Concrete Reinforcement
ACI 318	1989 (R 1992) Building Code Requirem for Reinforced Concrete
ACI 347R	1988 Formwork for Concrete

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 82	1990 (Rev. A) Steel Wire, Plain, for Concrete Reinforcement
ASTM A 123	1989 (Rev. A) Zinc (Hot-Dip Galvaniz Coatings on Iron and Steel Products
ASTM A 185	1990 (Rev. A) Steel Welded Wire Fabr Plain, for Concrete Reinforcement
ASTM A 496	1990 (Rev. A) Steel Wire, Deformed, Concrete Reinforcement
ASTM A 497	1990 (Rev. B) Steel Welded Wire Fabr Deformed, for Concrete Reinforcement
ASTM A 615/A 615M	1992 (Rev. B) Deformed and Plain Billet-Steel Bars for Concrete Reinf
ASTM A 616/A 616M	1992 Rail-Steel Deformed and Plain Ba for Concrete Reinforcement
ASTM A 617/A 617M	1992 Axle-Steel Deformed and Plain Ba for Concrete Reinforcement
ASTM A 706/A 706M	1992 (Rev. B) Low-Alloy Steel Deforme Bars for Concrete Reinforcement

ASTM C 31	1991 Making and Curing Concrete Test Specimens in the Field
ASTM C 33	1992 (Rev. A) Concrete Aggregates
ASTM C 39	1986 Compressive Strength of Cylindr Concrete Specimens
ASTM C 42	1990 Obtaining and Testing Drilled C and Sawed Beams of Concrete

ASTM C 94	1992 (Rev. A) Ready-Mixed Concrete
ASTM C 143	1990 (Rev. A) Slump of Hydraulic Cem Concrete
ASTM C 150	1992 Portland Cement
ASTM C 171	1992 Sheet Materials for Curing Conc
ASTM C 172	1990 Sampling Freshly Mixed Concrete
ASTM C 173	1993 Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C 227	1990 Potential Alkali Reactivity of Cement-Aggregate Combinations (Morta Method)
ASTM C 231	1991 (Rev. B) Air Content of Freshly Mixed Concrete by the Pressure Metho
ASTM C 260	1986 Air-Entraining Admixtures for Concrete
ASTM C 295	1990 Petrographic Examination of Aggregates for Concrete
ASTM C 309	1993 Liquid Membrane-Forming Compoun for Curing Concrete
ASTM C 330	1989 Lightweight Aggregates for Structural Concrete
ASTM C 494	1992 Chemical Admixtures for Concret
ASTM C 567	1991 Unit Weight of Structural Concrete
ASTM C 595	1993 Blended Hydraulic Cements
ASTM C 618	1993 Fly Ash and Raw or Calcined Nat Pozzolan for Use as a Mineral Admixt Portland Cement Concrete
ASTM C 881	1990 Epoxy-Resin-Base Bonding System Concrete

ASTM C 920	1987 Elastomeric Joint Sealants
ASTM C 989	1989 Ground Granulated Blast-Furnace for Use in Concrete and Mortars
ASTM C 1017	1992 Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C 1107	1991 (Rev. A) Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
ASTM C 1116	1991 Fiber-Reinforced Concrete and Shotcrete

ASTM D 1190	1974 (R 1980) Concrete Joint Sealer, Hot-Poured Elastic Type
ASTM C 1240	1993 Silica Fume for Use in Hydraulic-Cement Concrete and Mortar
ASTM D 1751	1983 (R 1991) Preformed Expansion Jo Filler for Concrete Paving and Struc Construction (Nonextruding and Resil Bituminous Types)
ASTM D 1752	1984 (R 1992) Preformed Sponge Rubbe Cork Expansion Joint Fillers for Con Paving and Structural Construction
ASTM D 4397	1991 Polyethylene Sheeting for Construction, Industrial, and Agricu Applications
ASTM E 1155	1987 Determining Floor Flatness and Levelness Using the F-Number System

AMERICAN WELDING SOCIETY, INC. (AWS)

AWS D1.4	1992 Structural Welding Code Reinfor Steel

CORPS OF ENGINEERS (COE)

COE CRD-C-572	1974 Polyvinylchloride Waterstop

FEDERAL SPECIFICATIONS (FS)

FS SS-S-200	(Rev. E) (Am. 2) Sealants, Joint, Two-Component, Jet-Blast Resistant, Cold-Applied, For Portland Cement Co Pavement
FS UU-B-790	(Rev. A Reinst) Building Paper, Vege Fiber: (Kraft, Waterproofed, Water and Fire Resistant)
FS SS-S-1614	(Rev. A) Sealants, Joint, Jet-Fuel-Resistant, Hot-Applied, for Cement and Tar Concrete Pavements

U.S. DEPARTMENT OF COMMERCE PRODUCT STANDARDS (PS)

1.2 DEFINITIONS

a. "Cementitious material" as used herein shall include all p cement, pozzolan, fly ash, ground iron blast-furnace slag, [silica fume].

b. "Exposed to public view" means situated so that it can be eye level from a public location after completion of the b A public location is accessible to persons not responsible operation or maintenance of the building.

1.3 SUBMITTALS

****
NOTE: Where a "G" in asterisk tokens follows a submittal item, it indicates Government approval for that item. Add "G" in asterisk tokens following any added or existing submittal items deemed sufficiently critical, complex, or aesthetically significant to merit approval by the Government. Submittal items not designated with a "G" will be approved by the QC organization.
****

Submit the following in accordance with Section 01300, "Submittals

1.3.1 SD-02, Manufacturer's Catalog Data

a. Waterstops

b. Materials for curing concrete

c. Joint sealants

d. Joint filler

e. Vapor barrier

[f. Epoxy bonding compound]

[g. Synthetic reinforcing fibers]

1.3.2 SD-04, Drawings

a. Reinforcing steel

b. Formwork

Reproductions of contract drawings are unacceptable.

1.3.2.1 Reinforcing Steel

ACI 315. Indicate bending diagrams, assembly diagrams, splicing a

laps of bars, shapes, dimensions, and details of bar reinforcing, accessories, and concrete cover. Do not scale dimensions from str drawings to determine lengths of reinforcing bars.

1.3.2.2 Formwork

****

NOTE: Include when either job complexity or aesthetics justify the additional cost associated with these requirements.

****

1.3.4.4 [Silica Fume Manufacturer's Representative

Provide statement that the manufacturer's representative will be p mix plant to ensure proper mix, including high range water reducer batching methods. [Representative to attend and advise at finishi sample slab.]]

1.3.5 SD-10, Test Reports

a. Concrete mix design

b. Fly ash

c. Pozzolan

d. Ground iron blast-furnace slag

[e. Aggregates]

[f. Fiber-reinforced concrete]

1.3.5.1 Concrete Mix Design

Submit copies of test reports showing that the mix has been succes tested to produce concrete with the properties specified and that be suitable for the job conditions. Test reports shall be submitt with the concrete mix design. Obtain approval before concrete pla

1.3.5.2 Fly Ash and Pozzolan

Submit test results in accordance with ASTM C 618 for fly ash and pozzolan. Submit test results performed within 6 months of submit

1.3.5.3 Ground Iron Blast-Furnace Slag

Submit test results in accordance with ASTM C 989 for ground iron blast-furnace slag. Submit test results performed within 6 months submittal date.

1.3.5.4 [Aggregates

****
NOTE: Include the following tests only when the quality of available aggregate is questionable.
****

ASTM C 227 for potential alkali-silica reactions, ASTM C 295 for

petrographic analysis.]

1.3.5.5 [Fiber-Reinforced Concrete

Test to determine flexural toughness index I5 in accordance with A 1116.]

1.3.6 [SD-17, Sample Installations

****

NOTE: Where flat surface finishing is important and the crew inexperienced in this type of concrete, ask for a sample installation to train the crew.

****

a. Slab finish sample

1.3.6.1 Slab Finish Sample

Install minimum of 10 foot by 10 foot slab. Finish as required by specification. [Silica fume manufacturer's representative will at advise.]

1.4 MODIFICATION OF REFERENCES

Accomplish work in accordance with ACI publications except as modi herein. Consider the advisory or recommended provisions to be man as though the word "shall" had been substituted for the words "sho "could" or "may," wherever they appear. Interpret reference to th "Building Official," the "Structural Engineer," and the "Architect/Engineer" to mean the Contracting Officer.

1.5 DELIVERY, STORAGE, AND HANDLING

Do not deliver concrete until vapor barrier, forms, reinforcement, items, and chamfer strips are in place and ready for concrete plac ACI 301 for job site storage of materials. Store reinforcement of different sizes and shapes in separate piles or racks raised above ground to avoid excessive rusting. Protect materials from contami such as grease, oil, and dirt. Ensure materials can be accurately identified after bundles are broken and tags removed.

PART 2 PRODUCTS

2.1 CONCRETE

2.1.1 [Contractor's Option for Material Only

****

NOTE: Use for SOUTHNAVFACENGCOM projects and elsewhere if approved. Fill in appropriate state and title of referenced specification where work is to be accomplished. If a special class of aggregate and a choice of other materials exists in the state specification, specify that class of aggregate and choice of material. Fill in applicable strength class or other appropriate identification of concrete strength specified in state Department of Transportation specifications. Do not use for LANTNAVFACENGCOM.

****

At the option of the Contractor, those applicable material section [_____] DOT RBS for Class [A] [_____] strength concrete shall gove lieu of this specification for concrete. Do not change the select during the course of the work.]

2.1.2 Contractor-Furnished Mix Design

****
NOTE: See Note B located at rear of text.
****

ACI 211.1, ACI 301, and ACI 318 [and ACI 211.2] [ACI 304.2R] [and] [ACI 213R] except as otherwise specified. The compressive strength (f'c) of the concrete for each portion of the structure(s) shall be as indicated [and as specified below].

Location	f'c (Min. 28-Day Comp. Strength) (psi)	ASTM C 33 Aggregate (Size No.)	Range of Slump (inches)	[Water-Cement Ratio] (by weight) [Ai
[All areas]	[_____]	[_____]	[_____]	[_____]
[Concrete exposed to weather	[4000]	[67] or [57]	[_____]	[0.50]
All other areas]	[_____]	[_____]	[_____]	[_____]
[Reinforced foundation walls and footings	[_____]	[_____]	[1-3]	[_____]
Plain footings, caissons, and substructure walls	[_____]	[_____]	[1-3]	[_____]
Beams and reinforced walls	[_____]	[_____]	[1-4]	[_____]
Building columns	[_____]	[_____]	[1-4]	
Pavement and exterior slabs	[_____]	[_____]	[1-3]	[_____]
Floor slabs	[_____]	[_____]	[_____]	[_____]
Floor toppings	[_____]	[_____]	[_____]	[_____]
Walks, curbs, and gutters	[_____]	[_____]	[_____]	[_____]
Utility structures	[_____]	[_____]	[_____]	[_____]

Drainage structures	[_____]	[_____]	[_____]	[_____]
[_____]	[_____]	[_____]	[_____]	[_____]

****

NOTE: Chlorides can cause corrosion of reinforcement. Use 0.15 for reinforced concrete exposed to chlorides in service, 1.00 for reinforced concrete that is dry or protected from moisture in service, and 0.30 for other reinforced concrete.

****

Maximum slump shown above may be increased one inch for methods of consolidation other than vibration. Slump may be increased to 7 i when superplasticizers are used. [Provide air entrainment using air-entraining admixture.] [The water soluble chloride ion concen in hardened concrete at ages from 28 to 42 days shall not exceed [[1.00] [0.30]].

2.1.2.1 [Lightweight Concrete Proportion

****
NOTE: Check with structural designer for unit weight of concrete. ACI 213R provides recommendations for lightweight concrete.
****

ACI 211.2. Provide ASTM C 330 aggregates for concrete; [115] [_____] pcf (dry) for floors with a [_____] psi minimum compressiv strength at 28 days. Provide aggregate size No. [_____]. Range o shall be between [_____] and [_____] inches. [Provide [_____] per entrainment using an air-entraining admixture.] [Maximum water-ce ratio shall be [_____].]]

2.1.2.2 Required Average Strength of Mix Design

The selected mixture shall produce an average compressive strength exceeding the specified strength by the amount indicated in ACI 30 When a concrete production facility has a record of at least 15 co tests, the standard deviation shall be calculated and the required compressive strength shall be determined in accordance with ACI 30 When a concrete production facility does not have a suitable recor tests to establish a standard deviation, the required average stre shall be as follows:

a. For f'c less than 3000 psi, 1000 psi plus f'c.

b. For f'c between 3000 and 5000 psi, 1200 psi plus f'c.

c. For f'c over 5000 psi, 1400 psi plus f'c.

2.2 MATERIALS

2.2.1 Cement

****
NOTE: See Note C located at rear of text.
****

ASTM C 150, Type [I or II] [_____] or ASTM C 595, Type [IP(MS) or IS(MS)] [_____] blended cement except as modified herein. The ble cement shall consist of a mixture of ASTM C 150 cement and one of following materials: ASTM C 618 pozzolan or fly ash, ASTM C 989 ground iron blast-furnace slag [, or silica fume]. The pozzolan o content shall not exceed 25 percent by weight of the total cementi material. The ground iron blast-furnace slag shall not exceed 50 by weight of total cementitious material. For exposed concrete, u manufacturer for each type of cement, ground slag, fly ash, and po

2.2.1.1 Fly Ash and Pozzolan

****

NOTE: See Note D located at rear of text.
****

ASTM C 618, Type N, F, or C, except that the maximum allowable los ignition shall be 6 percent for Types N and F. Add with cement.

2.2.1.2 Ground Iron Blast-Furnace Slag

ASTM C 989, Grade 120.

2.2.1.3 [Silica Fume

****
NOTE: See Note E located at rear of text.
****

****
NOTE: Use for high durability and low permeability. The initial cost of the concrete will increase, and supervision at the batch plant, finishing, and curing is necessary. A HRWR must be used with silica fume, the slump can be increased 2 to 5 inches without reducing strength. Finishing may be more difficult. Proper curing is essential because there is a tendency for plastic shrinkage cracking.
****

ASTM C 1240, provide silica fume that is a by-product of silicon o ferrosilicon production. Provide [5] [7] [10] percent by weight o total cementitious material.]

2.2.2 Water

Water shall be fresh, clean, and potable.

2.2.3 Aggregates

****
NOTE: Include the first bracketed item only when the quality of the available aggregate is questionable. Use the last bracketed item only for projects in Bermuda. When the use of alkali aggregates will be permitted, see Note I located at rear of text.
****

ASTM C 33, except as modified herein. Furnish aggregates for expo concrete surfaces from one source. Aggregates shall not contain a substance which may be deleteriously reactive with the alkalies in cement. [Aggregates shall show expansions less than 0.10 percent a months when tested in accordance with ASTM C 227 using a cement wi alkali content above 0.8 percent (expressed as sodium oxide), and possess properties or constituents that are known to have specific unfavorable effects in concrete when tested in accordance with AST 295.] [Furnish coarse aggregate from the Continental United States from the Walsingham formation in Bermuda.]

2.2.3.1 [Aggregates for Lightweight Concrete·

ASTM C 330.]

2.2.4 Nonshrink Grout

ASTM C 1107.

2.2.5 Admixtures

****
NOTE: Do not allow calcium chloride in concrete exposed to saltwater, severe sulfate solutions, or both moisture and chlorides.
****

Calcium chloride shall [not be used as an admixture] [not exceed 2 by weight of cement].

2.2.5.1 [Air-Entraining

ASTM C 260.]

2.2.5.2 Accelerating

ASTM C 494, Type C.

2.2.5.3 Retarding

ASTM C 494, Type B, D, or G.

2.2.5.4 Water Reducing

ASTM C 494, Type A, E, or F.

2.2.5.5 High Range Water Reducer (HRWR) (Superplasticizers)

ASTM C 494, Type F and ASTM C 1017. [Silica fume and HRWR shall come from the same manufacturer.]

2.2.6 Materials for Forms

Provide wood, plywood, or steel. Use plywood or steel forms where form finish is required. Lumber shall be square edged or tongue-a boards, free of raised grain, knotholes, or other surface defects. Plywood: PS-1, B-B concrete form panels or better. Steel form sur shall not contain irregularities, dents, or sags.

2.2.6.1 Form Ties and Accessories

The use of wire alone is prohibited. Form ties and accessories sh reduce the effective cover of the reinforcement.

2.2.7 Reinforcement

****
NOTE: Include bracketed item for projects in Bermuda.
****

[Bars, fabrics, connectors, and chairs shall be galvanized.]

2.2.7.1 Reinforcing Bars

****
NOTE: See Note I located at rear of text.
****

ACI 301 unless otherwise specified. ASTM A 615/A 615M and ASTM A 617/A 617M with the bars marked A, Grade [40] [60]; or ASTM A 616/ 616M with the bars marked R, Grade [50] [60]. [ASTM A 706/A 706M]. [Galvanized, ASTM A 123.

2.2.7.2 Mechanical Reinforcing Bar Connectors

ACI 301. Provide 125 percent minimum yield strength of the reinforcement bar.

2.2.7.3 Welded Wire Fabric

ASTM A 185 or ASTM A 497. Provide flat sheets of welded wire fabric for slabs and toppings.

2.2.7.4 Wire

ASTM A 82 or ASTM A 496.

2.2.7.5 Fiber-Reinforced Concrete

****
NOTE: See Note I located at rear of text.
****

In addition to the requirements specified above, fiber reinforced shall be provided in accordance with ASTM C 1116 Type III, synthet fiber reinforced concrete, and as follows. Synthetic reinforcing fibers shall be 100 percent virgin polypropylene fibrillated fiber containing no reprocessed olefin materials. Fibers shall have a s gravity of 0.9, a minimum tensile strength of 70 ksi, graded per manufacturer, and specifically manufactured to an optimum gradatio as concrete secondary reinforcement. A minimum of 1.5 pounds of f cubic yard of concrete shall be used. Fibers shall be added at th plant. [Toughness indices shall meet requirements for performance I.] [Provide the services of a qualified technical representative instruct the concrete supplier in proper batching and mixing of ma to be provided.]

2.2.8 Vapor Barrier

ASTM D 4397 polyethylene sheeting, minimum [6] [10] mil thickness.

****

NOTE: For SOUTHNAVFACENGCOM projects, delete paragraph above for "Vapor Barrier" and substitute with the following:

****

****

NOTE: For SOUTHNAVFACENGCOM use: Select first option where permanent vapor retarder is required. Select second option where vapor barrier is required to contain mixing water in freshly placed concrete

and a permanent vapor barrier is not required. For protection against hydrostatic pressure or conditions of excessive dampness, specify an appropriate waterproofing membrane in Division 7.

****

2.2.8.1 [Waterproof Paper

Kraft paper, glass reinforming fibers and layers of polyethylene l under heat and pressure to form a single layer meeting the require FS UU-B-790, Type I, Grade A, Style 4; or waterproof paper, regula conforming to ASTM C 171, consisting of two sheets of kraft paper cemented together with bituminous material in which are embedded c strands of fiber running in both directions not more than 1 1/4 in

2.2.8.2 Polyethylene Sheeting

ASTM D 4397, minimum [6] [10] mil thickness.]

2.2.9 Polyvinylchloride Waterstops

COE CRD-C-572.

2.2.10 Materials for Curing Concrete

2.2.10.1 Impervious Sheeting

ASTM C 171; waterproof paper, clear or white polyethylene sheeting polyethylene-coated burlap.

2.2.10.2 Pervious Sheeting

AASHTO M182.

2.2.10.3 Liquid Membrane-Forming Compound

ASTM C 309, white-pigmented, Type 2, Class B.

2.2.11 Liquid Chemical Sealer-Hardener Compound

Compound shall be magnesium fluosilicate which when mixed with wat seals and hardens the surface of the concrete. Do not use on exte slabs exposed to freezing conditions. Compound shall not reduce t adhesion of resilient flooring, tile, paint, roofing, waterproofin other material applied to concrete.

2.2.12 Expansion/Contraction Joint Filler

ASTM D 1751 or ASTM D 1752, 1/2 inch thick, unless otherwise indicated.

2.2.13 Joint Sealants

2.2.13.1 Horizontal Surfaces, 3 Percent Slope, Maximum

****

NOTE: For horizontal surfaces subject to jet fuel, specify FS SS-S-1614.

****

ASTM D 1190 or ASTM C 920, Type M, Class 25, Use T.

2.2.13.2 Vertical Surfaces Greater Than 3 Percent Slope

****
NOTE: Specify ASTM C 920 for vertical surfaces greater than 3 percent slope and not subject to jet fuel, gasoline, fuel oil, etc. For vertical surfaces greater than 3 percent slope and subject to jet fuel, specify FS SS-S-200, no sag.
****

ASTM C 920, Type M, Grade NS, Class 25, Use T. [FS SS-S-1614] [FS SS-S-200, no sag].

2.2.14 Epoxy Bonding Compound

ASTM C 881. Provide Type I for bonding hardened concrete to harde concrete; Type II for bonding freshly mixed concrete to hardened c and Type III as a binder in epoxy mortar or concrete, or for use i skid-resistant materials to hardened concrete. Provide Grade 1 or horizontal surfaces and Grade 3 for vertical surfaces. Provide Cl placement temperature is below 40 degrees F; Class B if placement temperature is between 40 and 60 degrees F; or Class C if placemen temperature is above 60 degrees F.

2.2.15 Dovetail Anchor Slot

Preformed metal slot approximately one inch by one inch of not les gage galvanized steel cast in concrete. Coordinate actual size an opening with dovetail anchors and provide with removable filler ma

PART 3 EXECUTION

3.1 FORMS

ACI 301. Provide forms, shoring, and scaffolding for concrete placement unless indicated or specified otherwise. [Concrete for may be placed in excavations without forms upon inspection and app the Contracting Officer. Excavation width shall be a minimum of 4 greater than indicated.] Set forms mortar-tight and true to line grade. Chamfer above grade exposed joints, edges, and external co concrete 0.75 inch unless otherwise indicated. Provide formwork w clean-out openings to permit inspection and removal of debris. Fo submerged in water shall be watertight.

3.1.1 Coating

Before concrete placement, coat the contact surfaces of forms with nonstaining mineral oil, nonstaining form coating compound, or two nitrocellulose lacquer. Do not use mineral oil on forms for surfa which adhesive, paint, or other finish material is to be applied.

3.1.2 Removal of Forms and Supports

After placing concrete, forms shall remain in place for the time p specified in ACI 347R. Prevent concrete damage during form remova

3.1.2.1 Special Requirements for Reduced Time Period

Forms may be removed earlier than specified if ASTM C 39 test resu of field-cured samples from a representative portion of the struct indicate that the concrete has reached a minimum of 85 percent of design strength.

3.1.3 Reshoring

Reshore concrete elements where forms are removed prior to the spe time period. Do not permit elements to deflect or accept loads du stripping or reshoring. Forms on columns, walls, or other load-be members may be stripped after 2 days if loads are not applied to t members. After forms are removed, slabs and beams over 10 feet in and cantilevers over 4 feet shall be reshored for the remainder of specified time period in accordance with paragraph entitled "Remov Forms." Perform reshoring operations to prevent subjecting concre members to overloads, eccentric loading, or reverse bending. Resh elements shall have the same load-carrying capabilities as origina and shall be spaced similar to original shoring. Firmly secure an reshoring elements to provide solid bearing and support.

3.2 PLACING REINFORCEMENT AND MISCELLANEOUS MATERIALS

ACI 301. Provide bars, wire fabric, wire ties, supports, and othe devices necessary to install and secure reinforcement. Reinforcem not contain rust, scale, oil, grease, clay, or foreign substances would reduce the bond. Rusting of reinforcement is a basis of rej the effective cross-sectional area or the nominal weight per foot reinforcement has been reduced to less than that specified in para entitled "Reinforcing Bars." Remove loose rust prior to placing s Tack welding is prohibited.

3.2.1 Vapor Barrier

****

NOTE: Include taping of joints when waterproof paper is specified.

****

Provide beneath the on-grade concrete floor slab. Use the greates and lengths practicable to eliminate joints wherever possible. La a minimum of 12 inches [and tape or cement joints]. Remove torn, punctured, or damaged vapor barrier material and provide with new barrier prior to placing concrete. Concrete placement shall not d vapor barrier material. [Place a 2-inch layer of clean concrete s vapor barrier before placing concrete.]

3.2.2 Reinforcement Supports

Place reinforcement and secure with galvanized or noncorrodible ch spacers, or metal hangers. For supporting reinforcement on the gr concrete or other noncorrodible material, having a compressive str equal to or greater than the concrete being placed.

3.2.3 Splicing

****

NOTE: When indicated, include ASTM A 767 and ASTM A 780 for zinc-coated (galvanized) bars. Add the following to paragraph entitled "Splicing" when applicable: "ASTM A 780: Repair the cut ends of

hot-dipped galvanized reinforcement steel to completely coat exposed steel."

****

As indicated. For splices not indicated ACI 301. Do not splice a points of maximum stress. Overlap welded wire fabric the spacing cross wires, plus 2 inches. [AWS D1.4. Welded splices shall be approved prior to use.]

3.2.4 Future Bonding

Plug exposed, threaded, mechanical reinforcement bar connectors wi greased bolt. Bolt threads shall match the connector. Countersin connector in the concrete. Calk the depression after the bolt is installed.

3.2.5 Cover

****

NOTE: Consult designer to verify that cover requirements of ACI 301 are adequate. ACI 201.2R and ACI 303R require additional cover for severe exposure conditions. Unless otherwise directed, specify 3-inch cover where exposed to seawater.

****

ACI 301 for minimum coverage, unless otherwise indicated.

3.2.6 Setting Miscellaneous Material

Place and secure anchors and bolts, pipe sleeves, conduits, and ot items in position before concrete placement. Plumb anchor bolts a location and elevation. Temporarily fill voids in sleeves with re removable material to prevent the entry of concrete.

3.2.7 Construction Joints

Locate joints to least impair strength. Continue reinforcement ac joints unless otherwise indicated.

3.2.8 Expansion Joints and Contraction Joints

Provide expansion joint at edges of interior floor slabs on grade vertical surfaces, and as indicated. Make expansion joints 1/2 in unless indicated otherwise. Fill expansion joints not exposed to with preformed joint filler material. Completely fill joints expo weather with joint filler material and joint sealant. Do not exte

reinforcement or other embedded metal items bonded to the concrete any expansion joint unless an expansion sleeve is used. Provide contraction joints, either formed or saw cut or cut with a jointin to the indicated depth after the surface has been finished. Sawed shall be completed within 4 to 12 hours after concrete placement. joints from intrusion of foreign matter.

3.2.9 Waterstop Splices

Fusion weld in the field.

3.3 BATCHING, MEASURING, MIXING, AND TRANSPORTING CONCRETE

ASTM C 94, ACI 301, ACI 302.1R, and ACI 304R, except as modified herein. Batching equipment shall be such that the concre ingredients are consistently measured within the following toleran percent for cement and water, 2 percent for aggregate, and 3 perce admixtures. Furnish mandatory batch ticket information for each l ready mix concrete.

3.3.1 Measuring

Make measurements at intervals as specified in paragraphs entitled "Sampling" and "Testing."

3.3.2 Mixing

****
NOTE: For WESTNAVFACENGCOM projects located at Marine Corps Base, Camp Pendleton, California, delete the first bracketed sentence.
****

ASTM C 94 and ACI 301. Machine mix concrete. Begin mixing within 30 minutes after the cement has been added to the aggregates. [Pl concrete within 90 minutes of either addition of mixing water to c aggregates or addition of cement to aggregates if the air temperat less than 85 degrees F.] Reduce mixing time and place concrete wi minutes if the air temperature is greater than 85 degrees F except follows: if set retarding admixture is used and slump requirement met, limit for placing concrete may remain at 90 minutes. Additio may be added, provided that both the specified maximum slump and water-cement ratio are not exceeded. When additional water is add additional 30 revolutions of the mixer at mixing speed is required the entrained air content falls below the specified limit, add a s quantity of admixture to bring the entrained air content within th specified limits.] Dissolve admixtures in the mixing water and mix drum to uniformly distribute the admixture throughout the batch.

3.3.3 Transporting

Transport concrete from the mixer to the forms as rapidly as pract Prevent segregation or loss of ingredients. Clean transporting eq thoroughly before each batch. Do not use aluminum pipe or chutes. concrete which has segregated in transporting and dispose of as di

3.4 PLACING CONCRETE

****
NOTE: See Note I located at rear of text.

****

Place concrete as soon as practicable after the forms and the rein have been inspected and approved. Do not place concrete when weat conditions prevent proper placement and consolidation; in uncovere during periods of precipitation; or in standing water. Prior to p concrete, remove dirt, construction debris, water, snow, and ice f within the forms. Deposit concrete as close as practicable to the position in the forms. Do not exceed a free vertical drop of 3 fe the point of discharge. Place concrete in one continuous operatio one end of the structure towards the other. Position grade stakes 10-foot centers maximum in each direction when pouring interior sl on 20-foot centers maximum for exterior slabs.

3.4.1 Vibration

ACI 301. Furnish a spare vibrator on the job site whenever concre placed. Consolidate concrete slabs greater than 4 inches in depth high frequency, internal, mechanical vibrating equipment supplemen hand spading and tamping. Consolidate concrete slabs 4 inches or depth by wood tampers, spading, and settling with a heavy leveling straightedge. Operate vibrators with vibratory element submerged concrete, with a minimum frequency of not less than 6000 impulses minute when submerged. Do not use vibrators to transport the conc the forms. Insert and withdraw vibrators approximately 18 inches Penetrate the previously placed lift with the vibrator when more t lift is required. Place concrete in 18-inch maximum vertical lift External vibrators shall be used on the exterior surface of the fo internal vibrators do not provide adequate consolidation of the co

3.4.2 [Application of Epoxy Bonding Compound

Apply a thin coat of compound to dry, clean surfaces. Scrub compo the surface with a stiff-bristle brush. Place concrete while comp stringy. Do not permit compound to harden prior to concrete place Follow manufacturer's instructions regarding safety and health pre when working with epoxy resins.]

3.4.3 [Pumping

****

NOTE: Pumping, especially lightweight concrete, requires careful attention to mix designs and pumping procedures. Allow pumping when other means of placement will be impractical or expensive.

****

ACI 304R and ACI 304.2R. Pumping shall not result in separation o loss of materials nor cause interruptions sufficient to permit los plasticity between successive increments. Loss of slump in pumpin equipment shall not exceed 2 inches. Concrete shall not be convey through pipe made of aluminum or aluminum alloy. Rapid changes in sizes shall be avoided. Maximum size of course aggregate shall be to 33 percent of the diameter of the pipe. Maximum size of well r aggregate shall be limited to 40 percent of the pipe diameter. Sa testing shall be taken at both the point of delivery to the pump a discharge end.]

3.4.3.1 [Pumping Lightweight Concrete

****

NOTE: Specify minimum of 564 pounds per cubic yard unless structural considerations require higher cement content. Require field trial run only when justified by job complexities or size.

****

ACI 213R. Aggregates shall be presoaked or presaturated. Cement content shall be minimum of [564][_____] pounds per cubic yard and sufficient to accommodate a 4- to 6-inch slump. [Field trial run made in accordance with ACI 213R.]]

3.4.4 Cold Weather

ACI 306.1. Do not allow concrete temperature to decrease below 50 degrees F. Obtain approval prior to placing concrete when the amb temperature is below 40 degrees F or when concrete is likely to be subjected to freezing temperatures within 24 hours. Cover concret provide sufficient heat to maintain 50 degrees F minimum adjacent the formwork and the structure while curing. Limit the rate of co 5 degrees F in any 1 hour and 50 degrees F per 24 hours after heat application.

3.4.5 Hot Weather

ACI 305R. Maintain required concrete temperature using Figure 2.1 ACI 305R to prevent the evaporation rate from exceeding 0.2 pound water per square foot of exposed concrete per hour. Cool ingredie before mixing or use other suitable means to control concrete temp and prevent rapid drying of newly placed concrete. Shade the fres concrete as soon as possible after placing. Start curing when the of the fresh concrete is sufficiently hard to permit curing withou Provide water hoses, pipes, spraying equipment, and water hauling equipment, where job site is remote to water source, to maintain a concrete surface throughout the curing period. Provide burlap cov other suitable, permeable material with fog spray or continuous we the concrete when weather conditions prevent the use of either liq membrane curing compound or impervious sheets. For vertical surfa protect forms from direct sunlight and add water to top of structu concrete is set.

3.5 SURFACE FINISHES EXCEPT FLOOR, SLAB, AND PAVEMENT FINISHES

3.5.1 Defects

Repair formed surfaces by removing minor honeycombs, pits greater 1-square inch surface area or 0.25-inch maximum depth, or otherwis defective areas. Provide edges perpendicular to the surface and p nonshrink grout. Patch tie holes and defects when the forms are r Concrete with extensive honeycomb including exposed steel reinforc cold joints, entrapped debris, separated aggregate, or other defec affect the serviceability or structural strength will be rejected, correction of defects is approved. Obtain approval of corrective prior to repair. The surface of the concrete shall not vary more allowable tolerances of ACI 347R. Exposed surfaces shall be unifo appearance and finished to a smooth form finish unless otherwise s

3.5.2 Not Against Forms (Top of Walls)

Surfaces not otherwise specified shall be finished with wood float surfaces. Finish shall match adjacent finishes.

3.5.3 Formed Surfaces

3.5.3.1 Tolerances

ACI 117 and as indicated.

3.5.3.2 As-Cast Rough Form

Provide for surfaces not exposed to public view. Patch this holes defects and level abrupt irregularities. Remove or rub off fins a projections exceeding 0.25 inch in height.

3.5.3.3 As-Cast Form

Provide form facing material producing a smooth, hard, uniform tex the concrete. Arrange facing material in an orderly and symmetric and keep seams to a practical minimum. Support forms as necessary required tolerances. Material with raised grain, torn surfaces, w edges, patches, dents, or other defects which will impair the text the concrete surface shall not be used. Patch tie holes and defec completely remove all fins.

3.5.4 [_____] Finish

****
NOTE: Add information where special type of finish is desired. See ACI 301 for information on smooth rubbed finish, grout cleaned finish, cork floated finish, and exposed aggregate. Areas requiring special finish should be clearly indicated on the drawings and coordinated with the specifications.
****

Provide concrete indicated with a [_____] finish as follows: [___

3.5.5 [Surface Finish Samples

****
NOTE: Include when either job complexity or aesthetics justify the additional cost associated with these requirements.
****

Provide a minimum of three sample concrete panels for each finish mix design, 3 feet by 3 feet, 3 inches thick. Use the approved co mix design(s). Provide sample panels on-site at locations directe approved, each set of panels shall be representative of each of th finishes specified and shall be representative of the workmanship finish(es) required. Do not remove or destroy samples until direc the Contracting Officer.]

3.6 FLOOR, SLAB, AND PAVEMENT FINISHES AND MISCELLANEOUS CONSTRUCT

****
NOTE: ACI 302.1R provides guidance for selection of specialty floor toppings. See Note K for guidance on tolerances.
****

ACI 302.1R, unless otherwise specified. Slope floors uniformly to drains where drains are provided. Depress the concrete base slab quarry tile, ceramic tile, [or] [_____] are indicated. Where stra measurements are specified, Contractor shall provide straightedge.

3.6.1 Finish

Place, consolidate, and immediately strike off concrete to obtain contour, grade, and elevation before bleedwater appears. Permit c to attain a set sufficient for floating and supporting the weight finisher and equipment. If bleedwater is present prior to floatin surface, drag the excess water off or remove by absorption with po

materials. Do not use dry cement to absorb bleedwater.

3.6.1.1 Scratched

Use for surfaces intended to receive bonded applied cementitious applications. After the concrete has been placed, consolidated, s off, and leveled to a Class C tolerance as defined below, the surf be roughened with stiff brushes of rakes before final set.

3.6.1.2 Floated

Use for [[surfaces to receive [roofing,] [waterproofing membranes, bed terrazzo,]][_____] [and] [exterior slabs where not otherwise specified.] After the concrete has been placed, consolidated, str and leveled, do not work the concrete further, until ready for flo Whether floating with a wood, magnesium, or composite hand float, bladed power trowel equipped with float shoes, or with a powered d float shall begin when the surface has stiffened sufficiently to p operation. During or after the first floating, surface shall be c with a 10-foot straightedge applied at no less than two different one of which is perpendicular to the direction of strike off. Hig shall be cut down and low spots filled during this procedure to pr surface level [within [1/4] [_____] inch in 10 feet] [with ASTM E tolerances as follows:

a. Minimum overall area F Flatness of FF-[_____] and minimum area F Levelness of FL-[_____].

b. Minimum local area F Flatness of FF-[_____] and minimum lo F Levelness of FL-[_____].]

3.6.1.3 [Concrete Containing Silica Fume]

Finish using magnesium floats or darbies. [Finish using technique demonstrated in the sample installation.]]

3.6.1.4 Steel Troweled

****

NOTE: ACI 302.1R suggests power troweling three times for Class 5 floors and where increased wear resistance is needed.

****

Use for floors intended as walking surfaces[,] [and] for reception coverings[, and] [_____]. First, provide a floated finish. The f shall next be power troweled [two] [three] [_____] times, and fina

troweled. The first troweling after floating shall produce a smoo surface which is relatively free of defects but which may still sh trowel marks. Additional trowelings shall be done by hand after t surface has hardened sufficiently. The final troweling shall be d a ringing sound is produced as the trowel is moved over the surfac surface shall be thoroughly consolidated by the hand troweling ope The finished surface shall be essentially free of trowel marks and in texture and appearance. The finished surface shall produce a s level [to within [1/4][_____] inch in 10 feet] [with ASTM E 1155 tolerances as follows:

a. Minimum overall area F Flatness of FF-[_____] and minimum area F Levelness of FL-[_____].

b. Minimum local area F Flatness of FF-[_____] and minimum lo F Levelness of FL-[_____].]

On surfaces intended to support floor coverings, any defects of su magnitude to show through the floor covering shall be removed by g

3.6.1.5 [Nonslip Finish

****
NOTE: Include when nonslip finish using dry shake aggregate is desired.
****

Use on surfaces of exterior platforms, steps, and landings; and on and interior pedestrian ramps. Apply dry shake aggregate of [cera bonded aluminum oxide] [_____] to the surface at a minimum rate of pounds per 100 square feet. Blend approximately two-thirds of the aggregate with portland cement as recommended by the manufacturer to the surface evenly and without segregation. After blended mate been embedded by floating, apply the remainder of the blended mate the surface at right angles to the previous application. Apply bl material heavier in any areas not sufficiently covered by the firs application. Perform a second floating immediately following the After the selected material has been embedded by the two floatings complete the operation with a [broomed] [floated] [troweled] finis

3.6.1.6 Broomed

Use on surfaces of exterior walks, platforms, patios, and ramps, u otherwise indicated. Perform a floated finish, then draw a broom belt across the surface to produce a coarse scored texture. Permi to harden sufficiently to retain the scoring or ridges. Broom tra to traffic or at right angles to the slope of the slab.

3.6.1.7 Pavement

Screed the concrete with a template advanced with a combined longi and crosswise motion. Maintain a slight surplus of concrete ahead template. After screeding, float the concrete longitudinally. Us straightedge to check slope and flatness; correct and refloat as necessary. Obtain final finish by [belting. Lay belt flat on the surface and advance with a sawing motion; continue until a uniform gritty nonslip surface is obtained.] [a burlap drag. Drag a strip clean, wet burlap from 3 to 10 feet wide and 2 feet longer than th pavement width across the slab. Produce a fine, granular, sandy t surface without disfiguring marks.] Round edges and joints with a having a radius of 1/8 inch.

3.6.1.8 Concrete Toppings Placement

The following requirements apply to the placement of toppings of c on base slabs that are either freshly placed and still plastic, or hardened base slabs.

a. Placing on a Fresh Base: Screed and bull float the base s soon as the water sheen has disappeared, lightly rake the of the base slab with a stiff bristle broom to produce a b surface for the topping. Immediately spread the topping m evenly over the roughened base before final set takes plac

the topping the finish [indicated on the drawings] [specif herein].

b. Bonding to a Hardened Base: When the topping is to be bon floated or troweled hardened base, roughen the base by sca grit-blasting, scabbling, planing, flame cleaning, or acid to lightly expose aggregate and provide a bonding surface. dirt, laitance, and loose aggregate by means of a stiff wi Keep the clean base wet for a period of 12 hours preceding application of the topping. Remove excess water and apply 1:1:1/2 cement-sand-water grout, and brush into the surfac base slab. Do not allow the cement grout to dry, and spre only short distances ahead of the topping placement. Do n the temperature differential between the completed base an topping mixture to exceed 10 degrees F at the time of plac Place the topping and finish as [indicated] [specified her

3.6.2 Concrete Walks

Provide 4 inches thick minimum. Provide contraction joints spaced linear feet unless otherwise indicated. Cut contraction joints on deep with a jointing tool after the surface has been finished. Pr 0.5-inch thick transverse expansion joints at changes in direction sidewalk abuts curb, steps, rigid pavement, or other similar struc space expansion joints every 50 feet maximum. Give walks a broome Unless indicated otherwise, provide a transverse slope of 1/4 inch foot. Limit variation in cross section to 1/4 inch in 5 feet.

3.6.3 Pits and Trenches

Place bottoms and walls monolithically or provide waterstops and k

3.6.4 Curbs [and Gutters]

Provide contraction joints spaced every 10 feet maximum unless oth indicated. Cut contraction joints 3/4 inch deep with a jointing t the surface has been finished. Provide expansion joints 1/2 inch spaced every 100 feet maximum unless otherwise indicated. Perform finish.

3.6.5 [Splash Blocks

Provide at outlets of downspouts emptying at grade. Splash blocks precast concrete, and shall be 24 inches long, 12 inches wide, and thick, unless otherwise indicated, with smooth-finished countersun sloped to drain away from the building.]

3.7 CURING AND PROTECTION

****
NOTE: See Note K located at rear of text.
****

ACI 301 unless otherwise specified. Begin curing immediately foll form removal. Avoid damage to concrete from vibration created by pile driving, movement of equipment in the vicinity, disturbance o formwork or protruding reinforment, and any other activity resulti ground vibrations. Protect concrete from injurious action by sun, flowing water, frost, mechanical injury, tire marks, and oil stain not allow concrete to dry out from time of placement until the exp

of the specified curing period. Do not use membrane-forming compo surfaces where appearance would be objectionable, on any surface t painted, where coverings are to be bonded to the concrete, or on c to which other concrete is to be bonded. If forms are removed pri expiration of the curing period, provide another curing procedure herein for the remaining portion of the curing period. Provide mo curing for those areas receiving liquid chemical sealer-hardener o epoxy coating.

3.7.1 Moist Curing

Remove water without erosion or damage to the structure.

3.7.1.1 Ponding or Immersion

Continually immerse the concrete throughout the curing period. Wa not be more than 20 degrees F less than the temperature of the con For temperatures between 40 and 50 degrees F, increase the curing 50 percent.

3.7.1.2 Fog Spraying or Sprinkling

Apply water uniformly and continuously throughout the curing perio temperatures between 40 and 50 degrees F, increase the curing peri percent.

3.7.1.3 Pervious Sheeting

Completely cover surface and edges of the concrete with two thickn wet sheeting. Overlap sheeting 6 inches over adjacent sheeting. shall be at least as long as the width of the surface to be cured. application, do not drag the sheeting over the finished concrete n sheeting already placed. Wet sheeting thoroughly and keep continu throughout the curing period.

3.7.1.4 Impervious Sheeting

Wet the entire exposed surface of the concrete thoroughly with a f of water and cover with impervious sheeting throughout the curing Lay sheeting directly on the concrete surface and overlap edges 12 minimum. Provide sheeting not less than 18 inches wider than the surface to be cured. Secure edges and transverse laps to form clo joints. Repair torn or damaged sheeting or provide new sheeting. wrap columns, walls, and other vertical structural elements from t down with impervious sheeting; overlap and continuously tape sheet joints; and introduce sufficient water to soak the entire surface completely enclosing.

3.7.2 Liquid Membrane-Forming Curing Compound

Seal or cover joint openings prior to application of curing compou Prevent curing compound from entering the joint. Apply in accorda the recommendations of the manufacturer immediately after any wate which may develop after finishing has disappeared from the concret surface. Provide and maintain compound on the concrete surface th the curing period. Do not use this method of curing where the use Figure 2.1.5 in ACI 305R indicates that hot weather conditions wil cause an evaporation rate exceeding 0.2 pound of water per square hour.

3.8.1 Sampling

ASTM C 172. Collect samples of fresh concrete to perform tests specified. ASTM C 31 for making test specimens.

3.8.2 Testing

3.8.2.1 Slump Tests

ASTM C 143. Take concrete samples during concrete placement. The maximum slump may be increased as specified with the addition of a approved admixture provided that the water-cement ratio is not exc

Perform tests at commencement of concrete placement, when test cyl are made, and for each batch (minimum) or every 10 cubic yards (ma concrete.

3.8.2.2 Temperature Tests

Test the concrete delivered and the concrete in the forms. Perfor in hot or cold weather conditions (below 50 degrees F and above 80 F) for each batch (minimum) or every 10 cubic yards (maximum) of c until the specified temperature is obtained, and whenever test cyl and slump tests are made.

3.8.2.3 Compressive Strength Tests

****

NOTE: When the same mix design is used for multiple elements such as slabs, beams, and walls, the design element type may be specified in lieu of or in addition to the mix design in order to better identify deficient concrete.

****

ASTM C 39. Make five test cylinders for each set of tests in accordance with ASTM C 31. Precautions shall be taken to prevent evaporation and loss of water from the specimen. Test two cylinde days, two cylinders at 28 days, and hold one cylinder in reserve. for strength tests of each [mix design of] [and for] [_____] concr placed each day shall be taken not less than once a day, nor less for each 100 cubic yards of concrete, nor less than once for each square feet of surface area for slabs or walls. For the entire pr take no less than five sets of samples and perform strength tests mix design of concrete placed. Each strength test result shall be average of two cylinders from the same concrete sample tested at 2 If the average of any three consecutive strength test results is l f'c or if any strength test result falls below f'c by more than 50 take a minimum of three ASTM C 42 core samples from the in-place w represented by the low test cylinder results and test. Concrete represented by core test shall be considered structurally adequate average of three cores is equal to at least 85 percent of f'c and single core is less than 75 percent of f'c. Locations represented erratic core strengths shall be retested. Remove concrete not meet strength criteria and provide new acceptable concrete. Repair cor with nonshrink grout. Match color and finish of adjacent concrete

3.8.2.4 [Air Content

ASTM C 173 or ASTM C 231 for normal weight concrete [and ASTM C

173 for lightweight concrete]. Test air-entrained concrete for ai content at the same frequency as specified for slump tests.]

3.8.2.5 [Unit Weight of Structural Lightweight Concrete

ASTM C 567. Determine unit weight of lightweight concrete. Perfo test for every 20 cubic yards maximum.]

3.8.2.6 [Ion Concentration

****

NOTE: Include only when justified by size of job or when quality of concrete is questionable.

****

ACI 318. Determine water soluble ion concentration. Perform test once for each mix design.]

-- End of Section --

CRITERIA NOTES

NOTE A: The following information shall be shown on the project drawings:

1. Loading assumptions.

2. Assumed temperature range when temperature stresses are a factor in design.

3. Material strengths used in design, f'c.

4. Yield strength of reinforcement required (40,000, 50,000, and 60,000 psi grades are available).

5. Details of reinforcement bars, showing number, sizes, bends, and stopping points of bars; details of stirrups; size, weight, and location of wire fabric reinforcement; and mechanical connections to reinforcement bars.

6. Details of concrete sections, showing dimensions, reinforcement cover, and required camber.

7. Joint details, showing locations and dimensions.

8. Details and locations of critical construction joints, including waterstop locations and splices, keys, and dowels when required.

9. Locations where structural lightweight concrete or lightweight insulation or fill concrete will be used.

10. Details which require a depressed structural slab for static-disseminating and spark-resistant tile, terrazzo, or other floor finishes in order to provide finished surfaces at the same elevations.

11. When exposed concrete surfaces are specified, the locations in the finished structure shall be indicated. If other than cast finish is required, the type and location shall be indicated.

NOTE B: Delete ACI 211.2 if lightweight concrete is

not specified. Delete ACI 304.2 and ACI 213R (lightweight) if pumping is not allowed. For concrete exposed to weather or special exposure conditions, leave in optional column[s] and select air entrainment and water-cement ratio.

AIR ENTRAINMENT AND AGGREGATE SIZE:

Aggregate Nominal Maximum Size (inches)	Size No.	Air Content, Percent Moderate Exposure
3/8	8	6-10
1/2	7	5-9

3/4	67	4-8
1	57	3.5-6.5
1 1/2	467	3-6

Maximum aggregate size should not exceed:

1. 1/5 the dimension of nonreinforced members.

2. 3/4 the clear spacing between reinforcing bars or between reinforcing bars and forms.

3. 1/3 the depth of nonreinforced slabs on the ground.

CONCRETE FOR FLOORS (From ACI 301): The following criteria applies only when structural or durability requirements do not necessitate higher strengths:

Class	Usual Traffic	Typical Uses	28 day Str. psi
1	Light foot	Residential or tile covered	3000
2	Foot	Offices, churches, schools, hospitals, residences	3500
3	Light foot & pneumatic wheels	Drives, garage floors, and sidewalks for residence	3500
4	Foot and pneumatic wheels	Light industrial, commercial	4000
5	Foot & wheels abrasive wear	Single-course industrial, integral topping	4500
6	Foot & steel-tire vehicles - severe abrasion	Two-course heavy industrial topping	See

REQUIREMENTS FOR SPECIAL EXPOSURE CONDITIONS (From ACI 318):

Exposure Condition	Max. Water-Cement Ratio (Normal Weight Aggregate)

Concrete intended to be watertight:

(a) Concrete exposed to fresh water	0.50
(b) Concrete exposed to brackish water or seawater	0.45

Concrete exposed to freezing and thawing in moist conditions:

(a) Curbs, gutters, guardrails, or thin sections	0.45
(b) Other elements	0.50

(c) In presence of deicing chemicals 0.45

For corrosion protection for reinforced concrete exposed to deicing salts, brackish water, seawater, or spray from these sources:

(a) Min. concrete cover per ACI 318 0.40

(b) ACI 318 cover exceeded by 0.50 in. 0.45

NOTE C: Acceptable types of cement are as follows:

ASTM C 150 Portland	ASTM C 595 Blended	
Type I	Type IP or IS	For general use in construction.
Type II	Type IP(MS) or Type IS(MS)	For general use in construction concrete is exposed to moderate action or where moderate heat of hydration is required. ASTM C 5 (blended hydraulic cements): ad suffix MS or MH where either mod sulfate resistance or moderate h hydration, respectively, is requ
Type III	None	For use when high early strength required.
Type V	None	For use when high sulfate resist required.

Modify paragraph and specify either 50 percent Type II, IP(MS) or IS(MS) cement with 50 percent ground iron blast-furnace slag, 75 percent Type II, IP(MS) or IS(MS) cement with 25 percent Class F fly ash, or Type V cement when structure is within a saltwater spray range of 25 feet height or within a horizontal distance of 10 feet. Require cement to meet chemical requirements of ASTM C 150, Table 1A when using alkali-reactive aggregates.

The customary requirements for a low tricalcium aluminate content for concrete in seawater reduces sulfate attack but can lead to increased chloride ion penetration thereby leading to rebar rusting. There are various ways to approach the problem:

1. Use a Type III or other cement with a 6 - 8 percent tricalcium aluminate content and take the chance of sulfate attack;

2. Use a cement with a low to moderate tricalcium aluminate content plus fly ash for sulfate attack, and calcium nitrite for anti-rust protection;

3. Use a low tricalcium aluminate cement plus microsilica plus calcium nitrite.

Designer must make a decision as to what risks are to be taken and what admixtures are to be used. The Notes should give some guidance so that a cost effective decision can be made.

NOTE D: Fly ash, pozzolan, and slag cement may produce uneven discoloration of the concrete during the early stages of construction, depending upon the type of curing provided. Fly ash or pozzolan meeting the specified test results, which are more stringent than ASTM C 618, should provide acceptable end results. Type C fly ash can be used as a replacement for up to 40 percent of the cement. Types F and C fly ash increase durability of concrete. Type F fly ash and slag are replacements for some sand and aggregates also adding to durability.

NOTE E: Use silica fume concrete for marine structures where low permeability and enhanced durability are necessary. The silica fume and high range water reducer additive should be from the same manufacturer. Since this is fairly new technology, the Contractor and Batch Plant may need help from the manufacturer. Select weight percentage based-on performance required.

NOTE F: When the use of alkali-reactive aggregates is permitted, delete everything after the first two sentences, add the following, and add paragraph entitled "Additional Curing When Using Alkali-Reactive Aggregates" as follows:

"Alkali-reactive aggregates may be used where not exposed to either seawater or alkali soil conditions, and when used with one of the following cements and tested in accordance with ASTM C 441 to ensure that a 75-percent minimum reduction of expansion due to alkali-aggregate reaction is provided.

1. ASTM C 150 low alkali cement (Table 1A, maximum of 0.60 percent equivalent Na2O).

2. ASTM C 595 blended cement.

3. ASTM C 150 low alkali, Type I or II cement

with fly ash, pozzolan, or ground slag.

Furnish a mix design utilizing alkali-reactive aggregates with a maximum water-cement ratio of 0.45."

"1.3.4 Additional Curing When Using Alkali-Reactive Aggregates

Furnish ASTM C 39 test results to verify the anticipated rate of strength development for the proposed concrete mix design. Submit an increased curing period and minimum time to strip formwork

based upon the reduced rate of strength development."

NOTE G: When indicated, include ASTM A 767 and A 780 for zinc-coated (galvanized) bars. Add the following to paragraph entitled "Splicing" when applicable: "ASTM A 780: Repair the cut ends of hot-dipped galvanized reinforcement steel to completely coat exposed steel. ASTM A 706/A 706M bars are mainly used in seismic design or for welding. Include ASTM A 123 for projects in Bermuda. If project has been designed for epoxy rebar, add ASTM A 775/A 775M, 1991 "Epoxy-Coated Reinforcing Steel Bars" in the reference paragraph and in the paragraph entitled "Reinforcing Bars."

NOTE H: Only use fiber reinforcement when approved by the designer. Drawings should indicate where fiber reinforced concrete is located. Fiber reinforcing is used to help: control cracking due to drying shrinkage and thermal expansion/contraction; reduce permeability; and increase impact capacity; shatter resistance, abrasion resistance, and toughness. Fiber reinforcing will not: control cracking due to structural stresses; significantly increase strength; control curling or creeping; justify reducing structural members; eliminate control joints; or replace any moment or structural steel reinforcement. Include flexural toughness tests when synthetic reinforcement fibers are used to increase toughness and when justified by size and importance of job, but not when fibers are used only to control shrinkage cracking. Include technical representative when warranted by size and importance of job.

NOTE I: When necessary to deposit concrete under water, add the following paragraph:

"3.3.4.3 Depositing Concrete Under Water

Methods and equipment used shall prevent the washing of the cement from the mixture, minimize the formation of laitance, prevent the flow of water through the concrete before it has hardened, and minimize disturbance to the previously placed

concrete. Do not deposit concrete in running water [, seawater,] or in water temperatures below 35 degrees F. Tremies, if used, shall be watertight and sufficiently large to permit a free flow of concrete. Keep the discharge end continuously submerged in fresh concrete. Keep the shaft full of concrete to a level well above the water surface. Discharge and spread the concrete by raising the tremie to maintain a uniform flow. Place concrete without interruption until the top of the fresh concrete is at the required height."

Add the following to paragraph entitled "Curing

Periods": "A structure permanently submerged in fresh water shall be cured for 12 hours minimum prior to being submerged in fresh water. A structure permanently submerged in seawater shall be cured for 5 days minimum prior to being submerged in seawater."

NOTE J: Specify F-numbers where flatness and levelness are critical. F-numbers provide a more accurate means of measuring floor tolerances and are being adopted by ACI. However, use of F-numbers is relatively new. Additional information may be found in ACI 117 and ACI 302. "Superflat" floors require special consideration and are beyond the scope of this guide. Approximate equivalence of F-numbers and straightedge measurements are as follows:

FF Flatness F-number	Maximum gap under freestanding leveled 10-ft straightedge (in.)
13	1/2
14	7/16
17	3/8
20	5/16
25	1/4
33	3/16
50	1/8

FL Levelness F-number	Maximum elevation difference between 2 points separated 10 ft (in.)
13	1
14	7/8
17	3/4
20	5/8
25	1/2
33	3/8
50	1/4

NOTE K: Add to "Curing and Protection" when using silica fume.

Prevent concrete with silica fume from drying by one or more of the following:

1. Misting surface of concrete with fog nozzle;

2. Liquid membrane-forming compound;

3. Pervious or impervious sheeting.

Increase curing time per manufacturer's recommendations.

NOTE L: Suggestions for improvement of this specification will be welcomed using the "Agency Response Form located in SPECSINTACT under "System Directory" or DD Form 1426. Suggestions should be

forwarded to:

Commanding Officer
Naval Construction Battalion Center
NAVFAC 15G/CESO 158
1000 23rd Avenue
Port Hueneme, CA 93043-4301

-- End --

Date Due: December 15, 1993
Date Prepared: January 6, 1994

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)
Agency Summary Report
for Fiscal Year 1993

Agency or Department: Department of Defense

Agency Contact: Bill Carlisle

Telephone Number: (703) 756- 4790 FAX: (703) 756-7648

I. **Specifications.** RCRA , Section 6002 (d) requires that Federal activities having responsibility for preparing specifications, review them to eliminate unnecessary requirements for the use of virgin materials and prohibitions against recovered materials and add preferences for recovered materials.

a. Does your agency have responsibility or control over a particular Federal Supply class or group of specifications or standards? Yes X No____

b. How many product specifications, standards, Commercial Item Descriptions (CIDs), product descriptions or other similar documents does your agency control? Number Not yet determined.

c. How many such documents have been reviewed prior to FY 1993 to:

(1) remove any unnecessary requirements for virgin material only? Number N/A

(2) remove language prohibiting the use of recovered materials? Number N/A

(3) add preference language for recovering materials? Number N/A

d. How many requirements for virgin materials only were deleted from such documents prior to FY 1993? Number N/A

e. How many references of language prohibiting the use of recovered materials were removed from such documents prior to FY 1993? Number N/A

f. How many preferences for recovered materials were added to such documents prior to FY 1993? Number N/A

g. How many such documents were reviewed in FY 1993 to:

(1) remove any unnecessary requirements for virgin materials only? Number N/A

(2) remove language prohibiting the use of recovered materials? Number N/A

(3) add preference language for recovered material? Number N/A

h. How many requirements for virgin materials only were deleted from such documents in FY 1993? Number N/A

i. How many references of language prohibiting use of recovered materials were removed from such documents in FY 1993? Number N/A

j. How many preferences for recovered materials were added to such documents in FY 1993? Number N/A

[Please provide examples of added or deleted requirements (append additional pages, if necessary).]

k. How many documents are scheduled for review in FY 1994? Number N/A

l. Do you know of any requirement for virgin materials or language prohibiting the use of recovered materials that should be deleted from specifications, CIDs or product descriptions? Yes X No ___

m. If yes, have you advised the managing agency to remove the requirement? Yes X No ___

n. Do you know of any specifications, CIDs or product descriptions that could be improved with the addition of preference language for recovered materials? Yes X No ___

o. If yes, have you advised the managing agency to add the requirement? Yes X No ___

[Please provide some details such as copies of correspondence, examples of products and description of actions.]
The items are marine and aviation lubricating oils; the Defense Fuel Supply Center has tasked the Military Services to review their specification for these commodities.

II. Affirmative Procurement Programs

A. Specific Requirements. RCRA, Section 6002(i) requires that, within one year after the date of publication of applicable guidelines by EPA, each procuring agency develop an affirmative procurement program to assure that items composed of recovered materials be purchased to the maximum extent practicable. To date, EPA has published guidelines for the following products.

Description	Federal Register Notice and Date	Code of Federal Regulations
Cement and Concrete Containing	48 FR 4230 1/28/83	40 CFR Part 249
Paper and Paper Products	53 FR 23546 6/22/88	40 CFR Part 250
Lubricating Oils Containing Re-refined Oil	53 FR 24699 6/30/88	40 CFR Part 252

Retread Tires	53 FR 46558 11/17/88	40 CFR Part 253
Building Insul. Products	54 FR 7328 2/17/89	40 CFR Part 248

1. **Fly Ash.**

a. Has your agency implemented an affirmative procurement program for cement and concrete containing fly ash? Yes ____ No __X____
As of the end of the FY 93 reporting period, DoD had not issued a Department-wide policy on an affirmative procurement program, but individual components had taken some initial steps.

b. If yes, when? Date: __1993__ Does the program meet the minimum requirements of RCRA, Sect 6002(i), and of 40 CFR Part 249? Yes_X_
No _____

c. If yes, please attach copy. If no, please provide schedule for full implementation. Expected in CY 1994.

d. Total dollar amount of concrete and cement purchased by your agency in FY 1993. $54 million (estimate) (Pertains only to major new construction projects; excludes locally-managed maintenance and repair, minor new construction or alteration work.)

e. Total dollar amount of concrete and cement containing fly ash purchased by your agency in FY 1993. $16 million (estimate) Estimated quantity for major new construction only; excludes maintenance and repair, minor construction and alteration work.)

f. If the dollar amount of concrete and cement containing fly ash purchased is less than the total amount of concrete and cement purchased, is the difference attribute able to:

(1) the lack of a good preference program.
Yes __X__ No _____
It is unlikely that all of the Department's concrete and cement requirements can be met using products containing fly ash. We are attempting to implement changes which will identify the amount of product containing fly ash which we purchase; if these products are more expensive, specific authority to pay premium prices may be required

(2) lack of availability of concrete and cement containing fly ash at competitive prices. Yes ___ No ____ Unknown

(3) differing performance requirements of the two products.
Yes _____ No _____ Unknown

(4) the lack of specific contract or other provision that identify a clear preference for concrete and cement containing fly ash. Yes ___X____ No _____

(5) other reason, such as the lack of availability, competition or an unusual or unreasonable delay. Yes __X____ No_____
(append pages to describe) Current Government construction policies and practices provide for material performance specifications by which projects are designed and contracts awarded.

Changes are required to permit agencies to specify the use of recycled fly ash concrete.

2. **Paper and Paper Products.** [GSA will provide data for agencies' purchases of paper products made through their retail and wholesale stock programs. However, please provide amounts for agency purchases from any other sources.]

a. Has your agency implemented an affirmative procurement program for recycled paper and paper products? Yes __X__ No _____

b. If yes, when? Date: __1993__ Does the program meet the minimum requirements of RCRA, Section 6002(i), and of 40 CFR 250? Yes __X__ No _____

c. If yes, please attach copy. If no, please provide schedule for full implementation. Previously provided.

d. Total dollar amount of paper and paper products purchased by your agency from sources other than GSA retail and wholesale stock programs in FY 1993 $37 million (estimate)

e. Total dollar amount of paper and paper products containing recycled material purchased by your agency from sources other than GSA retail and wholesale stock programs in FY 1993 $10 million (estimate)

f. If the dollar amount of recycled paper and paper products purchased is less than the total amount of paper and paper products purchased, is the difference attributable to:

(1) the lack of a good preference program. Yes ___ No __X__ (Recycled writing and copy paper is sometimes more expensive than virgin product. If this price differential continues, specific authority may be required to pay premium prices for recycled paper.

(2) lack of availability of recycled paper at competitive prices. Yes __X__ No _____ (Recycled paper is sometimes 10% to 20% more expensive than virgin paper.)

(3) differing performance requirements of the two products. Yes __X__ No ____ (Some users assert that recycled paper is not suitable for all applications. These assertions need to be disproved in order to increase use of recycled paper.)

(4) the lack of specific contract or other provisions that identify a clear preference for recycled paper products. Yes __X__ No_____ (If price differential continue between recycled and virgin paper, specific authority for payment of premium prices may be required.

(5) other reasons, such as the lack of availability, competition or an unusual or unreasonable delay. Yes __X__ No _____ Reasons cited include lack of knowledge about product availability.)

3. **Lubricating Oils.**

a. Has your agency implemented an affirmative procurement program for lubricating oils containing re-refined oil? Yes _____ No __X__

Defense Logistics Agency has taken the lead in developing a program in conjunction with oil re-refiners.

b. If yes, when? Date: 1992 Does the program meet the minimum requirements of RCRA, Section 6002(i), and of 40 CFR 250?
Yes _____ No X

c. If yes, please attach copy. If no, please provide schedule for full implementation. Expected in CY 1994.

d. Total dollar amount of lubricating oils purchased by your agency FY 1993 $57 million (estimate)

e. Total dollar amount of lubricating oils containing re-refined oil purchased by your agency in FY 1993 $.3 million (estimate)

f. If the dollar amount of lubricating oil containing re-refined oil purchased is less than the total amount of lubricating oil purchased, is the difference attributable to:

(1) the lack of a good preference program.
Yes X No _____ (As of the FY 93 reporting period, DoD had not issued a Department-wide policy on re-refined oil. This should be done in CY 1994.

(2) lack of availability of re-refined oil at competitive prices. Yes X No ____

(3) differing performance requirements of the two products.
Yes _____ No ____ Unknown.

(4) the lack of specific contract or other provisions that identify a clear preference for re-refined oil.
Yes _____ No X

(5) other reasons, such as the lack of availability, competition or an unusual or unreasonable delay. Yes X No _____ (append pages to describe) Lack of availability of producers meeting QPL requirements and the lack of a Department-wide affirmative procurement program.

4. Retread Tires. [Refer to the Federal Supply Schedule for Pneumatic Tires, FSC Group 26, Part II, Section A for items covered by this guidelines.]

a. Has your agency implemented an affirmative procurement program for retread tire? Yes____ No X As of the end of the FY 93 reporting period, DoD had not issued a Department-wide affirmative procurement program for retread tires; such a program is expected in CY 1994.

b. If yes, when? Date: _____ Does the program meet the minimum requirements of RCRA, Section 6002(i), and of 40 CFR 250?
Yes _____ No _____

c. If yes, please attach copy. If no, please provide schedule for full implementation. Expected in CY 1994.

d. Total dollar amount of tires (excluding airplane tires) purchased by your agency FY 1993 $80 million (estimate)

e. Total dollar amount of retread tires (excluding airplane tires) purchased by your agency in FY 1993 $1 million (estimate)

f. If the dollar amount of retread tires purchased is less than the total amount of tires purchased, is the difference attributable to:

(1) the lack of a good preference program. Yes X No _____ (As of the end of the FY 93 reporting period, DoD had not issued a Department-wide policy on an affirmative procurement program; such a program is expected in CY 1994.

(2) lack of availability of retread tires at competitive prices. Yes X No _____ (Retreads for specialized materials handling equipment and grounds maintenance equipment are not readily available.)

(3) differing performance requirements of the two products. Yes _____ No X

(4) the lack of specific contract or other provisions that identify a clear preference for retread tires. Yes X No _____

(5) other reasons, such as the lack of availability, competition or an unusual or unreasonable delay. Yes X No (Reasons include the lack of availability for the special purpose equipment used in DoD.)

5. **Building Insulation Products.**

a. Has your agency implemented an affirmative procurement program for building insulation products containing recycled materials? Yes _____ No X (As of the end of the FY 93 reporting period, DoD had not issued a Department-wide policy on an affirmative procurement program. Such a program is expected in CY 1994.

b. If yes, when? Date:_____ Does the program meet the minimum requirements of RCRA, Section 6002(i), and of 40 CFR 250? Yes _____ No _____ N/A

c. If yes, please attach copy. If no, please provide schedule for full implementation. Expected in CY 1994.

d. Total dollar amount of building insulation products purchased by your agency in FY 1993 $14 million (estimate)

e. Total dollar amount of building insulation products containing recycled materials purchased by your agency in FY 1993 $14 million (estimate)

f. If the dollar amount of building insulation products containing recycled materials purchased is less than the total amount of building insulation purchased, is the difference attributable to: N/A

(1) the lack of a good preference program. Yes _____ No _____

(2) lack of availability of building insulation products containing recycled materials at competitive prices. Yes No

(3) differing performance requirements of the two products.
Yes _____ No _____

(4) the lack of specific contract or other provisions that identify a clear preference for building insulation products containing recycled materials. Yes _____ No _____

(5) other reasons, such as the lack of availability, competition or an unusual or unreasonable delay. Yes _____ No _____
(append pages to describe)

B. General Requirements.

1. Describe, using additional pages as necessary, the principal elements of your agency's affirmative procurement program(s) for:

a. giving preference to, and promoting, the acquisition and use of the products covered by the EPA guidelines; (1) All contract solicitations for re-refined oil issued by the Defense General Supply Center now include preference clauses. (2) Many installations are now using remanufactured laser tone print cartridges, "speed bumps," picnic tables and trash cans made with recycled plastic. Additionally, asphalt made with recycled content is being purchased. The Naval Supply Systems Command has also eliminated a prohibition against retread tire purchases formerly maintained in its system.

b. requiring the estimation, certification and verification of recovered materials utilized in the performance of a contract;

c. requiring language in contracts on the purchase and use of products covered by the EPA guidelines: See B. 1. a. above.

d. reviewing and monitoring the effectiveness of your affirmative procurement program(s): We make reports, including this one, on our progress on affirmative procurement programs. We ar working to develop improved data bases from which to make such reports; this is quite labor intensive, and the work is not yet complete.

2. Describe other actions taken by your agency to acquire products containing recycled materials. We work to educate buyers, users and approving officials of the benefits of using products made with recycled content. We hold a annual joint Services recycling workshop to stress the importance of the program and to encourage employees to rededicate themselves to the success of the program.

3. Describe problems and suggestions for resolving any problems encountered by your agency in implementing RCRA. The labor intensive effort required to track and document acquisition of recycled products is a major problem. Improved automated tracking systems would greatly alleviate this problem.

C. Other

1. Please identify the kinds of recycled items, others than the guideline items, purchased by your agency. Aircraft tires, personal computer equipment and materials used in packaging (stretch wrap, pallets, steel and plastic strapping, etc.)

2. What future EPA guidelines could be developed to cover your agency's major acquisitions and have the greatest impact on reducing the solid waste stream. The EPA is working with the Department to assure that future guideline items are relevant to acquisition programs.

DEPARTMENT OF DEFENSE

FISCAL YEAR 1993 SUMMARY REPORT

(RCRA, SEC 6002, AND EXECUTIVE ORDER 12873)

(Dollars in Millions)

	Virgin	Recycled	Total	Percent Recycled
Paper	30.8	11.1	41.9	26.5
Fly Ash	56.7	28.0	84.7	33.1
Insulation	--0--	23.7	23.7	100.0
Lube Oil	55.6	.4	56.0	---
Retread Tires	78.9	1.0	79.9	1.4

Date Due: December 15, 1992
Date Prepared: September 15, 1993

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)
Agency Summary Report
for Fiscal Year 1992

Agency or Department: Department of Defense

Agency Contact: William Carlisle

Office of the Assistant Deputy Under Secretary of Defense

(Environmental Security/Pollution Prevention)

Telephone Number: (703) 756- 4790 FAX: (703) 756-7648

I. **Specifications. RCRA** , Section 6002 (d) requires that Federal activities having responsibility for preparing specifications, review them to eliminate unnecessary requirements for the use of virgin materials and prohibitions against recovered materials and add preferences for recovered materials.

a. Does your agency have responsibility or control over a particular Federal Supply class or group of specifications or standards? Yes **X** No____

b. How many product specifications, standards, Commercial Item Descriptions (CIDs), product descriptions or other similar documents does your agency control? Number **Not yet determined**

c. How many such documents have been reviewed prior to FY 1992 to:

(1) remove any unnecessary requirements for virgin material only? Number **N/A**

(2) remove language prohibiting the use of recovered materials? Number **N/A**

(3) add preference language for recovering materials? Number **N/A**

d. How many requirements for virgin materials only were deleted from such documents prior to FY 1992? Number **N/A**

e. How many references of language prohibiting the use of recovered materials were removed from such documents prior to FY 1992? Number ___**N/A**___

f. How many preferences for recovered materials were added to such documents prior to FY 1992? Number ___**N/A**___

g. How many such documents were reviewed in FY 1992 to:

(1) remove any unnecessary requirements for virgin materials only? Number ___**N/A**___

(2) remove language prohibiting the use of recovered materials? Number ___**N/A**___

(3) add preference language for recovered material? Number ___**N/A**___

h. How many requirements for virgin materials only were deleted from such documents in FY 1992? Number___**N/A**___

i. How many references of language prohibiting use of recovered materials were removed from such documents in FY 1992? Number ___**N/A**___

j. How many preferences for recovered materials were added to such documents in FY 1992? Number ___**N/A**___

k. How many documents are scheduled for review in FY 1993? Number___**N/A**___

l. Do you know of any requirement for virgin materials or language prohibiting the use of recovered materials that should be deleted from specifications, CIDs or product descriptions? Yes _____ No __**X**__ **(None at this time.)**

m. If yes, have you advised the managing agency to remove the requirement? Yes _____ No _____

n. Do you know of any specifications, CIDs or product descriptions that could be improved with the addition of preference language for recovered materials? Yes __**X**__ No _____

o. If yes, have you advised the managing agency to add the requirement? Yes __**X**__ No _____

II. Affirmative Procurement Programs

A. Specific Requirements.

1. Fly Ash.

a. Has your agency implemented an affirmative procurement program for cement and concrete containing fly ash?
Yes _____ No __X__ **(As of the FY 92 reporting period, DoD had not issued a Department-wide policy on an Affirmative Procurement Program, but individual components have taken some initial steps.)**

b. If yes, when? Date: _____ Does the program meet the minimum requirements of RCRA, Sect 6002(i), and of 40 CFR Part 249? Yes _____ No _____

c. If yes, please attach copy. If no, please provide schedule for full implementation. **Expected by early 1994.**

d. Total dollar amount of concrete and cement purchased by your agency in FY 1992. **$159,000,000 (est)** **(Pertains only to major new construction projects; excludes locally-managed maintenance & repair, minor new construction or alteration work.)**

e. Total dollar amount of concrete and cement containing fly ash purchased by your agency in FY 1992. **$23,000,000 (est)** **(Estimated quantity for major new construction only, excludes maintenance & repair, minor construction or alteration work.)**

f. If the dollar amount of concrete and cement containing fly ash purchased is less than the total amount of concrete and cement purchased, is the difference attribute able to:

(1) the lack of a good preference program.
Yes __X__ No _____ **(It is unlikely that all of DoD's concrete and cement requirements can be satisfied using products with fly ash content. We are attempting to implement procedures to identify the amount of product containing fly ash and will shortly issue policy guidance on the desirability of increasing our purchases of cement and concrete with fly ash. If these products are more expensive, then specific authority to pay premium prices may be required.)**

(2) lack of availability of concrete and cement containing fly ash at competitive prices. Yes ____ No ____**Unknown**

(3) differing performance requirements of the two products.
Yes _____ No _____ **Unknown**

(4) the lack of specific contract or other provision that identify a clear preference for concrete and cement containing fly ash. Yes ___**X**___ No _____

(5) other reason, such as the lack of availabiity, competition or an unusual or unreasonable delay.
Yes ___**X**___ No_____ **(Current government construction policies & procedures provide for materials performance specifications by which projects are designed and contracts awarded, changes would be required that permit agencies to require the use of recycled fly ash in concrete.)**

2. **Paper and Paper Products.**

a. Has your agency implemented an affirmative procurement program for recycled paper and paper products?
Yes _____ No _____ **(As of the reporting date for this report DoD had not yet implemented a Department-wide program, but the individual components had taken some initial steps. A DoD policy memorandum was issued on February 3, 1993 to all the Services and components establishing a recycled paper preference program.)**

b. If yes, when? Date: __**February 3, 1993**__ Does the program meet the minimum requirements of RCRA, Section 6002(i), and of 40 CFR 250? Yes _____ No _____

c. If yes, please attach copy. If no, please provide schedule for full implementation. **(Attached is a copy of the DoD February 3, 1993 memorandum.)**

d. Total dollar amount of paper and paper products purchased by your agency from sources other than GSA retail and wholesale stock programs in FY 1992 __**$40,000,000 (est)**__

e. Total dollar amount of paper and paper products containing recycled material purchased by your agency from sources other than GSA retail and wholesale stock programs in FY 1992
$14,000,000 (est)

f. Estimated percentage of paper and paper product purchases made by your agency through GSA retail and wholesale stock programs ___**90%**___

g. If the dollar amount of recycled paper and paper products purchased is less than the total amount of paper and paper products purchased, is the difference attributable to:

(1) the lack of a good preference program. Yes ___X___ No _____ **(Recycled writing & copy paper is sometimes more expensive than virgin paper. If this price differential continues, specific authority may have to be sought to pay premium prices for recycled paper.)**

(2) lack of availability of recycled paper at competitive prices. Yes __X__ No _____ **(Recycled copier paper is generally 10 - 25 % more expensive than virgin paper.)**

(3) differing performance requirements of the two products. Yes __X__ No _____ **(Assertions are that recycled paper is not suitable for all uses. This requires research, testing and definitive answers.)**

(4) the lack of specific contract or other provisions that identify a clear preference for recycled paper products. Yes __X__ No_____ **(If price differentials continue between recycled and virgin paper, specific authority may be required to permit payment of premiums for recycled paper.)**

(5) other reasons, such as the lack of availability, competition or an unusual or unreasonable delay. Yes ___X___ No _____**(Reasons cited include lack of knowledge about the availability through GSA.)**

3. Lubricating Oils.

a. Has your agency implemented an affirmative procurement program for lubricating oils containing re-refined oil? Yes _____ No __X__ **(Defense Logistics Agency (DLA) has taken the lead in working with the Defense General Supply Center (Richmond, VA) and the Army in developing a program in conjunction with the oil re-refiners.)**

b. If yes, when? Date: _____ Does the program meet the minimum requirements of RCRA, Section 6002(i), and of 40 CFR 250? Yes _____ No _____

c. If yes, please attach copy. If no, please provide schedule for full implementation. **(Expected by Early 1994.)**

d. Total dollar amount of lubricating oils purchased by your agency FY 1992 ___**$59,000,000 (est)**___

e. Total dollar amount of lubricating oils containing re-refined oil purchased by your agency in FY 1992 **$200,000 (est)**

f. If the dollar amount of lubricating oil containing re-refined oil purchased is less than the total amount of lubricating oil purchased, is the difference attributable to:

(1) the lack of a good preference program.
Yes ___X___ No _____ **(As of the FY 92 reporting period, DoD had not issued a Department-wide policy on an Affirmative Procurement Program. This should be rectified in early 1994.)**

(2) lack of availability of re-refined oil at competitive prices. Yes ___X___ No _____ **(During FY 1992, only one producer was qualified to bid on DoD contracts; the producer did not bid on DLA purchases.)**

(3) differing performance requirements of the two products.
Yes _____ No _____ **Unknown**

(4) the lack of specific contract or other provisions that identify a clear preference for re-refined oil.
Yes ___X___ No _____

(5) other reasons, such as the lack of availability, competition or an unusual or unreasonable delay.
Yes ___X___ No _____**(Reasons include lack of a Department-wide affirmative procurement program.)**

4. Retread Tires.

a. Has your agency implemented an affirmative procurement program for retread tire? Yes_____ No ___X___
(As of the FY 92 reporting period, DoD had not issued a Department-wide policy on an Affirmative Procurement Program for retread tires, but individual components have taken some initial steps.)

b. If yes, when? Date: _____ Does the program meet the minimum requirements of RCRA, Section 6002(i), and of 40 CFR 250? Yes _____ No _____

c. If yes, please attach copy. If no, please provide schedule for full implementation. **(Expected by Early 1994.)**

d. Total dollar amount of tires (excluding airplane tires) purchased by your agency FY 1992 **$125,000,000 (est)**

e. Total dollar amount of retread tires (excluding airplane tires) purchased by your agency in FY 1992 **$300,000 (est)**

f. If the dollar amount of retread tires purchased is less than the total amount of tires purchased, is the difference attributable to:

(1) the lack of a good preference program. Yes **X** No _____ **(As of the FY 92 reporting period, DoD had not issued a Department-wide policy on an Affirmative Procurement Program. This should be rectified in Early 1994.**

(2) lack of availability of retread tires at competitive prices. Yes **X** No _____ **(Retreads for special materials handling equipment & grounds maintenance equipment are not readily available.)**

(3) differing performance requirements of the two products. Yes _____ No **X**

(4) the lack of specific contract or other provisions that identify a clear preference for retread tires. Yes **X** ___ No _____

(5) other reasons, such as the lack of availability, competition or an unusual or unreasonable delay. Yes **X** No _____
(Reasons cited include lack of availability for the special purpose equipment found in DoD.)

5. **Building Insulation Products.**

a. Has your agency implemented an affirmative procurement program for building insulation products containing recycled materials? Yes _____ No **X**
(As of the FY92 reporting period, DoD had not issued a Department-wide policy on an Affirmative Procurement Program, but some components had taken some initial steps in researching the usability of insulation products from recycled materials.)

b. If yes, when? Date: _____ Does the program meet the minimum requirements of RCRA, Section 6002(i), and of 40 CFR 250? Yes _____ No _____ **(N/A)**

c. If yes, please attach copy. If no, please provide schedule for full implementation. **(Expected by Early 1994.)**

d. Total dollar amount of building insulation products purchased by your agency in FY 1992 **$35,000,000 (est)**

e. Total dollar amount of building insulation products containing recycled materials purchased by your agency in FY 1992 **$35,000,000 (est)**

f. If the dollar amount of building insulation products containing recycled materials purchased is less than the total amount of building insulation purchased, is the difference attributable to:

(1) the lack of a good preference program.
Yes _____ No _____

(2) lack of availability of building insulation products containing recycled materials at competitive prices.
Yes _____ No _____

(3) differing performance requirements of the two products.
Yes _____ No _____

(4) the lack of specific contract or other provisions that identify a clear preference for building insulation products containing recycled materials. Yes _____ No _____

(5) other reasons, such as the lack of availability, competition or an unusual or unreasonable delay.
Yes _____ No _____

B. General Requirements.

1. Describe the principal elements of your agency's affirmative procurement program(s) for:

a. giving preference to, and promoting, the acquisition and use of the products covered by the EPA guidelines;
(The DoD was instrumental in planning, organizing and conducting the very first federal recycled products trade fair in June 1992, with the object of bringing together federal agency product users, specifiers, procurement and acquisition officials and the manufacturers and marketers of products with recycled content. This effort was taken in joint cooperation with OMB/OFPP, EPA, GSA, and others. DoD is committed to being a leader in environmental stewardship and is working towards a

rational policy requiring the use of products meeting the EPA guidelines, when available and when strategic missions are not compromised.)

b. requiring the estimation, certification and verification of recovered materials utilized in the performance of a contract;
(We are currently working with the Military Services and EPA on ways to quantify uses of recycled materials. Work is not yet complete.)

c. requiring language in contracts on the purchase and use of products covered by the EPA guidelines:
(We are currently working with the Military Services and EPA on ways to require the use of recycled materials in various contracts. Work is not yet complete.)

d. reviewing and monitoring the effectiveness of your affirmative procurement program(s):
(We make reports, including this one, on our progress on affirmative procurement programs. We are working to improve the data bases from which these reports are compiled and are making incremental improvement.)

2. Describe other actions taken by your agency to acquire products containing recycled materials.
(Educating users, buyers, specifiers, and approving officials of the availability and acceptability of products made from recycled materials using various venues such as workshops, trade fairs and newsletters. The Resource Recovery and Recycling Task Group, a subgroup of the DoD Pollution Prevention Committee, meets bimonthly with representatives from GSA, EPA, OFPP to discuss recycling and affirmative procurement issues. We also encourage free interchange between policy and program staffs.)

3. Describe problems and suggestions for resolving any problems encountered by your agency in implementing RCRA.
(Intensive labor required to track and document acquisition of recycled products. Procurement of recycled content products at times may be more costly than products from virgin materials. Improved Information Management Systems might be beneficial.)

C. Other

1. Please estimate the percentage of your agency's acquisitions that are covered by the five EPA guideline areas.
(As a whole, less than 5%, however, some components may go as high as 35%.)

2. What future EPA guidelines could be developed to cover your agency's major acquisitions and have the greatest impact on reducing the solid waste stream.
(Aircraft tires; personal computer components, such as circuit boards, casings, and other plastic components; and materials used in DoD's extensive packaging requirements, such as: stretch wrap, pallets, gummed tape, steel and plastic strapping are major items not covered by EPA guidelines and could have significant impact.)

3. Of the total dollar amount of all recycled products purchased by your agency, what percentage represents items other than those covered by the guidelines? **(Unknown)**

4. Please identify the kinds of recycled items, other than the guideline items, purchased by your agency. **(Steel, HDPE plastics, furniture.)**

5. How has the implementation of Executive Order 12780 affected your agency's acquisition requirements and procurement of recycled goods and services?
(Supply officers and users have been made more aware of the impending requirement and are increasingly ordering products made from recycled materials. More sustained interest in the collection and sale of recycled materials.)

DOD 6002 RCRA REPORT FOR FY 1992

	Virgin	Recycled	Total	% Recycled
	($ Millions)			
Paper	25.6	13.9	39.5	35.2
Fly Ash	135.9	22.9	158.8	14.4
Insulation	0	35.2	35.2	100
Lube Oil	58.7	0.2	58.9	0.4
Retread	124.8	0.3	125.1	0.2

NOT MEASUREMENT SENSITIVE

MIL-STD-961C
20 MAY 1988

SUPERSEDING
MIL-STD-961B
31 MAY 1985

MILITARY STANDARD

MILITARY SPECIFICATIONS AND ASSOCIATED DOCUMENTS, PREPARATION OF

AMSC D4397

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FOREWORD

1. This military standard is approved for use by all Departments and Agencies of the Department of Defense.

2. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Director, Defense Standardization Program Office (DSPO), 5203 Leesburg Pike, Suite 1402, Falls Church, VA 22041-3466, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

3. This standard was written expressly for the writer of military specifications and contains integrated instructions for the preparation of the following:

Specifications
Appendixes
Indexes
Revisions
Supplements
Amendments
Notices
Specification sheets
Associated detail specifications

4. The Department of Defense is committed to increased defense contractor productivity and improved acquisition efficiency. Military specifications and associated documents play an important role in this context and must be prepared with this objective in mind. They define requirements. They must allow for the various contractual circumstances and environments that exist and must promote an atmosphere in which appropriate cost, benefit, and risk tradeoffs can be made.

5. Significant changes have been made to this standard as a result of DoD policy to selectively apply and tailor military standardization documents. These changes reflect the DoD belief that the format, tone, and content of standardization documents are important to cost effective use of these documents.

6. Proper preparation and use of standardization documents are difficult tasks requiring careful analysis and good judgment. The following points highlight areas of policy emphasis, intent, or changes. Areas where actual problems have been encountered on specific documents are also included. They are intended as a "checklist" to assist in document preparation.

a. For commercial products, before developing a new military specification, or revising an existing one, consideration should first be given to developing a non-Government standard or including DoD requirements in an existing non-Government standard (see DoD Directive 4120.20), or developing or revising a commercial item description or federal specification.

b. Documents should be structured and formatted to categorize requirements as precisely as possible. Requirements that are generally necessary but can occasionally be removed should be written so that they can be tailored out while leaving other requirements unaffected. Requirements that are necessary only in certain instances should be written so that they can be tailored in. There is sufficient flexibility to make adjustments which may be required for a particular document.

c. Detailed application guidance should be provided in the "Notes" section of each document. The purpose of this guidance is to provide noncontractual information on when and how to use the document. Information such as the following is recommended: (1) how to apply the document to different contract types and different program phases, (2) the source of and flexibility inherent with specific document requirements, (3) guidance on what is required to satisfy document requirements, (4) the extent of Government review and approval, and (5) the relationship between the particular document and other related documents in the acquisition process.

d. A carefully documented, permanent record should be maintained by the specification or document preparing activity of the source and reason behind particular requirements and changes to requirements. The rationale (measurement, testing, judgment, etc.) behind a specific numeric level is one example of what the record should contain. Issues and controversial areas during the coordination process should be noted, and it may be desirable to summarize these issues and areas in the "Notes" section of the document and solicit feedback as experience develops. This record should provide a basis for related application guidance and a history useful in future document revisions.

e. Clear distinction should be made between requirements portions and guidance ("Notes" section) portions of documents. Careful attention to use of the words "should" (guidance language) and "shall" (requirement language) is important.

f. Requirement statements should be clear and unambiguous. One test to apply in preparing a document is to ask what will a contractor have to do as a result of this requirement. The answer should be apparent to both the Government and the contractor.

g. To the extent possible, requirements should be stated in performance or "what-is-necessary" terms, as opposed to telling a contractor "how to" perform a task.

h. Care should be taken to avoid unnecessary reference to other standardization documents and document "tiering". References should be justified. When only a portion of another document needs to be referenced, only that portion should be referenced. Allow for tailoring of document references when this is appropriate.

i. Strong justification and extreme care is necessary when referencing management system or program type documents. These documents lose visibility (and possible tailoring efforts done elsewhere are lost) when categorically imposed in this manner. It is usually more effective to specify these documents or specific portions of them directly in the contract.

j. Ways to increase the use of commercial products and non-Government standards which will satisfy Government requirements should be an important consideration during document preparation or revision. Efforts to identify possibilities, encourage their use, or reduce impediments to their use should be reflected in standardization document contents.

k. Data item descriptions should be developed and circulated with standardization documents during the draft coordination stages, when applicable.

l. Documents should allow for contractor systems and contractor data when they will satisfy Government requirements.

m. Feedback on the success or difficulties (benefits and costs) encountered in the application of the document on specific contracts should be encouraged. Such feedback may be made by DD Form 1426, by Material Deficiency Reports, or by letter or other appropriate forms. Contractor/industry and Government experience should be directed to the preparing activity or other appropriate offices.

n. Efforts should be made to encourage and obtain inputs and perspectives outside of a document's normal proponent group (such as the quality, reliability, or packaging communities).

o. Care should be taken to ensure that industry comments are requested during the draft stages of document preparation and that proper Government coordination occurs.

p. MS sheet form standards were previously covered by MIL-STD-962. Since these documents are primarily used as procurement specifications, their requirements have been moved to MIL-STD-961. The term "MS sheet" now stands for "military specification sheet," and as existing MS sheets are revised, they will conform to the requirements contained in this standard.

q. The figures appearing at the back of this standard are only examples. If there is any conflict between the text and the figures, the text applies.

r. Specifying acceptable quality levels (AQL's) as firm military specification requirements inhibits quality improvement and precludes competition based on excellence. Such specification requirements imply that defects are allowable and institutionalize the process of accepting non-conforming materiel. Such requirements need to be purged from our specifications and recognized as the province of contract administration. Specific values for AQL's and lot tolerance percent defectives (LTPD's) are no longer to be included as requirements in military specifications. Specification requirements define the performance and physical characteristics of a product for the purpose of acquisition. Inspections and tests are included to ensure uniform methods for verification of compliance with specification requirements. Sampling inspection procedures are valuable tools and are acceptable for verification of contract requirements. Acceptance of products other than fully compliant with military specification requirements is an administrative and contractual matter and is not properly a part of a military specification.

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1. SCOPE

1.1 Scope. This standard establishes the formats, contents, and procedures for the preparation of the military specification and its associated documents, prepared either by Government activities or under contract (see 6.4).

2. APPLICABLE DOCUMENTS

2.1 Government documents.

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

STANDARDS

FEDERAL

FED-STD-123	-	Marking for Shipment (Civil Agencies).
FED-STD-313	-	Material Safety Data Sheets, Preparation and the Submission of.
FED-STD-376	-	Preferred Metric Units for General Use by the Federal Government.

MILITARY

MIL-STD-12	-	Abbreviations for Use on Drawings, and in Specifications, Standards and Technical Documents.
MIL-STD-109	-	Quality Assurance Terms and Definitions.
MIL-STD-129	-	Marking for Shipment and Storage.
DOD-STD-963	-	Data Item Descriptions (DID), Preparation of.
MIL-STD-2073-1	-	DoD Materiel Procedures for Development and Application of Packaging Requirements.

HANDBOOK

MILITARY

DOD-HDBK-248	-	Guide for Application and Tailoring of Requirements for Defense Material Acquisitions.

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Naval Publications and Forms Center, (ATTN: NPODS), 5801 Tabor Avenue, Philadelphia, PA 19120-5099.)

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

DODISS	-	Department of Defense Index of Specifications and Standards.
DOD Federal Acquisition Regulation Supplement, Part 27	-	Data Requirements.
DOD 5010.12-L	-	DOD Acquisition Management Systems and Data Requirements Control List (AMSDL).
DOD Directive 5230.24	-	Distribution Statements on Technical Documents.
DOD Standardization Directory SD-1	-	Standardization Directory.
DOD Cataloging Handbook H2-1	-	Federal Supply Classification, Part 1, Groups and Classes.
DOD Cataloging Handbook H6	-	Federal Item Name Directory for Supply Cataloging.

United States Government Printing Office (GPO) Style Manual.

(Copies of DOD 5010.12-L (on a subscription basis), DOD Directive 5230.24, and SD-1 are available from the Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120-5099. Copies of Cataloging Handbooks H2-1 and H6 are available from the Commander, Defense Logistics Services Center, Battle Creek, MI 49017-3084. Copies of the DOD Federal Acquisition Regulation Supplement, and GPO Style Manual are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-0001. Copies of the DODISS are available on a yearly subscription basis either from the Government Printing Office for hard copy, or microfiche copies are available from the Director, Navy Publications and Printing Service Office, 700 Robbins Avenue, Philadelphia, PA 19111-5093.)

2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Y14.5M	-	Dimensioning and Tolerancing. (DoD adopted)
ANSI Z39.14	-	American National Standard for Writing Abstracts.

(Application for copies should be addressed to the American National Standards Institute, 1430 Broadway, New York, NY 10018-3308.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM E 380 - Standard for Metric Practice. (DoD adopted)

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1187.)

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 260 - IEEE Standard Letter Symbols for Units of Measurement. (DoD adopted)
IEEE 268 - Metric Practice. (DoD adopted)

(Application for copies should be addressed to the Institute of Electrical and Electronics Engineers, 445 Hoes Lane, Piscataway, NJ 08854-4150.)

(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.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. DEFINITIONS

3.1 Acronyms used in this standard. The acronyms used in this standard are defined as follows:

a. AMSC - Acquisition Management Systems Control.

b. AMSDL - Acquisition Management Systems and Data Requirements Control List.

c. BMIN - Bulk Material Identification Number.

d. CDRL - Contract Data Requirements List.

e. CLIN - Contract Line Item Number.

f. DDMO - Defense Data Management Office.

g. DepSO - Departmental Standardization Office.

h. DID - Data Item Description.

i. DoD - Department of Defense.

j. DODISS - Department of Defense Index of Specifications and Standards.

k. DODSSP - Department of Defense Single Stock Point.

l. DPSO - Defense Product Standards Office.

m. DSPO - Defense Standardization Program Office.

n. FAR - Federal Acquisition Regulation.

o. FIIN - Federal Item Identification Number.

p. FIPS - Federal Information Processing Standards.

q. FSC - Federal Supply Class.

r. FSG - Federal Supply Group.

s. GPO - Government Printing Office.

t. NASA - National Aeronautics and Space Administration.

u. NATO - North Atlantic Treaty Organization.

v. NIIN - NATO Item Identification Number.

w. NPFC - Naval Publications and Forms Center.

x. NSN - National Stock Number.

y. PIN - Part or Identifying Number.

z. QML - Qualified Manufacturers List.

aa. QPL - Qualified Products List.

bb. SI - Le Systeme International d'Unites.

3.2 Amendment. An amendment is a listing of changes to a specification.

3.3 Application. The process of reviewing and selecting from available specifications, standards, and related documents those that have application to particular materiel acquisitions and contractually invoking them wholly, or in part, at the most advantageous time in the acquisition cycle.

3.4 Associated detail specification. The associated detail specification is an extension of a general specification that covers detailed requirements for specific parts, materials, or equipments. The associated detail specification is prepared in the six-section format.

3.5 Class. This term provides additional categorization of differences in characteristics other than that afforded by type classification, which does not constitute a difference in quality or grade, but are for specific, equally important uses, and is usually designated by Arabic numerals, such as, "class 1" or "class 2."

3.6 Composition. This term is used in classifying commodities that are differentiated strictly by their respective chemical composition and is designated in accordance with accepted trade practice.

3.7 Coordinated military specification. A coordinated military specification is a document required by more than one military department and is coordinated with various activities of the interested departments.

3.8 Data. Recorded information, regardless of form or method of the recording.

3.9 Data Item Description (DID), DD Form 1664. A completed form that defines the data required of a contractor. The form specifically defines the data content, preparation instructions, format, and intended use. DID's are prepared in accordance with DOD-STD-963.

3.10 General specification. A general specification is prepared in the six-section format and covers requirements and test procedures that are common to a group of parts, materials, or equipments. It is used with either associated detail specifications or specification sheets (not a mixture).

3.11 Grade. This term usually implies differences in quality and is usually designated by capital letters, such as, "grade A" or "grade B."

3.12 Hard conversion. A hard conversion is the process of changing a measurement from inch-pound units to non-equivalent metric units, which necessitates physical configuration changes of the item outside those permitted by established measurement tolerances. The term "hard conversion" is in general use in the United States, although it is technically incorrect as applied to specific items because no "conversion" takes place. Instead, a new metric item requiring a new part identification is created to eventually replace the customary item. The new item is often referred to as being in "hard metric."

3.13 Hybrid item. An item designed and produced using both metric and inch-pound units even though it may be described by only one system of units in standardization documents.

3.14 Hybrid specification. A hybrid specification is one in which some requirements are given in rounded, rational metric units, and other requirements are given in rounded, rational inch-pound units. Hybrid specifications are often required for use in new designs where existing usable components must interface in a metric system.

3.15 Inch-pound specification. Inch-pound specifications have requirements given in rounded, rational, inch-pound units, usually as a result of being originally developed in inch-pound. The magnitudes are meaningful and practical. Inch-pound specifications should include those with rounded, rational, inch-pound units only (any needed metric unit conversions should be in conformance with 4.11.2). NOTE: There have been instances where magnitudes expressed in metric units as a result of mathematical conversion from rounded, rational, inch-pound units are given first (preferred units) with the rounded, rational inch-pound units given in parenthesis or in a non-preferred position. These specifications are inch-pound documents. Inch-pound specifications are developed for items to interface or operate with other inch-pound items.

3.16 Interchangeable item. An item that possesses such functional and physical characteristics as to be equivalent in performance, reliability, and maintainability, to another item of similar or identical purposes; and is capable of being exchanged for the other item without selection for fit or performance, and without alteration of the items themselves or of adjoining items, except for adjustment.

3.17 Interim amendment. An interim amendment is a limited coordination amendment to a coordinated specification required by a single military department or activity to meet a need when time does not permit preparation of a coordinated amendment.

3.18 Limited coordination military specification. A limited coordination military specification covers items of interest to a single military department or activity, and is prepared to meet the acquisition needs of that department or activity.

3.19 Lot or batch. A collection of units of product from which a sample is to be drawn and inspected to determine conformance with the acceptability criteria and may differ from a collection of units designated as a lot or batch for other purposes.

3.20 Measurement sensitive specification. A measurement sensitive document is one in which application of the requirements depends substantively on some measured quantity (for example, the document contains requirements for dimensions which are critical to the interfacing of the item).

3.21 Metric specification. Metric specifications have requirements given in rounded, rational, metric units, usually as a result of being originally developed in metric. The magnitudes expressed are meaningful and practical. Documents containing only electrical units which are used in both the metric and inch-pound systems (for example, volts, amps, and ohms) are classified as metric documents. Documents also containing dimensional interfaces must have these interfaces in metric sizes to be classed as metric documents. Metric specifications are developed for items to interface or operate with other metric items.

3.22 Metric units. Metric units are a system of basic measures defined by the International System of Units based on "Le Systeme International d'Unites (SI)," of the International Bureau of Weights and Measures. These units are described in ASTM E 380 and IEEE 268.

3.23 Metrication. Metrication is the process of changing to the metric system, including the act of developing metric standardization documents or converting current standardization documents to metric units of measurement.

3.24 Military specification. A military specification covers systems, subsystems, components, items, materials, or products that are intrinsically military in character or are used in, or in support of, weapons systems and involve an essential system function or interface.

3.25 Non-Government standard. A standardization document developed by a private sector association, organization, or technical society which plans, develops, establishes, or coordinates standards, specifications, handbooks, or related documents. Non-Government standards adopted by the DoD are listed in the DODISS.

3.26 Non-Government standards body. A non-Government standards body is a private sector association, organization, or technical society which plans, develops, establishes, or coordinates non-Government standards.

3.27 Not measurement sensitive specifications. A not measurement sensitive specification is one in which application of the requirements does not depend substantively on some measured quantity. This type of specification can be used with either a metric system or an inch-pound system.

3.28 Part or Identifying Number (PIN). A Part or Identifying Number (PIN) is an alpha-numeric designator which identifies parts, items, or bulk materials, that are covered by a specification. The term "PIN" replaces the terms "part number" and "Bulk Material Identification Number (BMIN)" previously used in this standard.

3.29 Qualification. Qualification, as used in this standard, applies to the formal process of including provisions in a specification stipulating the methods by which it would be determined that a manufacturer's products or capabilities are examined and certified to be in conformance with specification requirements, and the subsequent approval for or listing of products on a qualified products list (QPL), or manufacturers on a qualified manufacturers list (QML).

3.30 Rationalization. Rationalization is a planned simplification by reducing the number of item configurations and relating such configurations in a rational manner, usually in a preferred number progression.

3.31 Replacement item. An item which is interchangeable with another item, but which differs physically from the original item in that the installation of the replacement item requires operations such as drilling, reaming, cutting, filing, or shimming, in addition to the normal application and methods of attachment.

3.32 Soft conversion. A soft conversion is the process of changing a measurement from inch-pound units to equivalent metric units within acceptable measurement tolerances without changing the physical configuration of the item.

3.33 Specification. A document prepared specifically to support acquisition which clearly and accurately describes essential technical requirements for purchasing materiel. Procedures necessary to determine that the requirements for the materiel covered by the specification have been met are also included.

3.34 Specification sheet. The specification sheet is an abbreviated form of an associated detail specification, with the material presented in graphic or tabular format, not always requiring full sentences. The specification sheet is prepared either on 8-1/2 by 11 inch bond paper or on a DD Form 672.

3.35 Stand alone specification. A stand alone specification covers all requirements for one or more types of items so as not to require preparation and reference to an associated detail specification or specification sheet. A stand alone specification is prepared in the six-section format.

3.36 Standard sample. A representative sample, provided by, or as directed by, the acquisition activity to illustrate qualities or characteristics that cannot be readily described because test procedures or design data are not available, or because certain qualities and characteristics cannot be definitely expressed, such as the texture of fur, color of cloth, or the grain of wood.

3.37 Standardization document. As used in this standard, "standardization document" is a generic term that includes all the documents covered by this standard.

3.38 Style. This term is used to denote differences in design or appearance.

3.39 Substitute item. An item which possesses such functional and physical characteristics as to be capable of being exchanged for another, only under specified conditions or in particular applications, and without alteration of the items themselves or the adjoining items.

3.40 Supplement. A listing of associated detail specifications, specification sheets, or MS sheets associated with a general specification.

3.41 Tailoring. The process by which individual requirements (sections, paragraphs, or sentences) of specifications, standards, and related documents are evaluated to determine the extent to which they are most suitable for a specific system and equipment acquisition and the modification of these requirements to ensure that each achieves an optimal balance between operational needs and cost (see DOD-HDBK-248 and 4.2.1). The tailoring of data product specifications and DID's shall be limited to the exclusion of information requirement provisions.

3.42 Type. This term implies differences in like items or processes relative to design, model, shape, or other configuration and is usually designated by Roman numerals, such as "type I" or "type II."

3.43 "USED IN LIEU OF" limited coordination military specification. A "USED IN LIEU OF" limited coordination military specification is a revision to a coordinated specification required by a military department to meet a need when time does not permit preparation of a revision to a coordinated military specification.

3.44 Volatile organic compounds (VOC's). A VOC is any organic compound of carbon (excluding methane, 1,1,1 trichloroethane, methylene chloride, trifluoromethane (FC-23), and trichlorotrifluoroethane (CFC-113), dichlorodifluoromethane (CFC-12), trichlorofloromethane (CFC-11), chlorodifluoromethane (CFC-22), dichlorotetrafluoroethane (CFD-114), and chloropentafluoroethane (CFC-115)) in materials other than pesticides, herbicides, and materials primarily used as fuels.

4. GENERAL REQUIREMENTS

4.1 General. This section covers general aspects of style, format, and general requirements for preparing a six-section specification. See figure 1 for a checklist that may be used as a guide, and figure 2 for a list of standard paragraphs that are required or required when applicable.

4.2 Coverage. A specification shall be prepared to describe essential technical requirements for purchasing materiel (see 6.3). Similar items shall be covered in a single specification to the maximum extent practical. Specifications shall describe the item in a manner which will encourage maximum competition. Insofar as practicable, requirements shall be in terms of performance. Requirements shall not be specified to a degree of unnecessary exactness or restrictiveness, but shall be detailed only to the degree necessary to ensure the acquisition of items adequate for the purpose to be covered. When other than form, fit, and function requirements are necessary to ensure interchangeability with respect to reparable items, it is permissible to specify details of design such as dimensions, materials, composition, and physical and chemical requirements to the extent necessary to ensure interchangeability of replacement parts.

4.2.1 Selective application and tailoring of requirements.

a. Selective application and tailoring of requirements as part of the streamlining process requires careful consideration at the development stage of the individual specification. The concept of tailoring is covered in DOD-HDBK-248 and must be planned and organized by the specification writer. To be a successfully tailorable document, the specification must be written so that it is structured in such a manner that selection or modification of requirements will not create conflict, ambiguity, or result in an incomplete specification when used as a contractual document.

b. In writing the specification, consideration shall be given to each section to ensure that users are made aware of the flexibility available in the use of the document. References, requirements, and quality assurance provisions shall be written so they can be tailored for each phase in the acquisition cycle. As appropriate, each requirement, together with the associated means for verification, should stand on its own.

4.2.2 Hazardous materials specifications. Specifications that describe products containing hazardous materials (see 5.3.3.6) shall include requirements for the preparation and delivery of Material Safety Data Sheets in accordance with FED-STD-313. FED-STD-313 lists specific FSC's for which Material Safety Data Sheets must be submitted for all items, and provides criteria for judging whether Material Safety Data Sheet submission is required for other materials. Where necessary, section 6 of the specification shall contain a note to the contracting officer to identify activities that need to receive copies of the Material Safety Data Sheets (see 5.3.6.13).

4.3 Data requirements.

4.3.1 Physical commodity specifications. New and revised specifications prepared to address physical commodities shall not contain requirements for data, such as the development, preparation, submission, delivery, maintenance, updating, approval, or distribution of plans, reports, drawings, manuals, and other data products. Rather, all requirements for data must be specified on DD Form 1423, Contract Data Requirements List (CDRL), in the contract; or, when DD Form 1423 is optional (see DOD FAR Supplement 27.475-1), the data is specified in the contract or acquisition document. The information specified in 5.3.6.5a and b may be included in section 6 of the specification to indicate the types of data which may be required in conjunction with the specification.

4.3.2 Data product specifications. New and revised specifications prepared to address data products (with the exception of technical manuals covered in 4.3.3), such as engineering drawings, technical data packages, test reports, and plans require the concurrent preparation of Data Item Descriptions (DID's) by the preparing activity of the specification. The DID's shall be prepared in accordance with DOD-STD-963, coordinated with the specification, and submitted to the Defense Data Management Office (DDMO), via the appropriate DoD component representative, with the specification for clearance and assignment of an AMSC number to the DID's and to the specification. The information specified in 5.3.6.5c shall be included in section 6 of the specification to indicate the DID's that must be included in the contract to acquire the data product defined in the specification.

4.3.3 Technical manual specifications. New and revised specifications prepared to address technical manuals for the installation, operation, maintenance, training, and support of weapon systems, weapon system components, and support equipment do not require the preparation of DID's, but are required to be submitted to the DDMO for clearance and assignment of AMSC numbers. The information specified in 5.3.6.5d shall be included in section 6 of the specification to indicate the proper contractual method of acquiring the technical manuals.

4.3.4 Qualification data. Requirements for data necessary for qualification and qualification retention shall be in section 4 of the specification (see 5.3.4.7 and 5.3.4.8). DID's are not required to obtain the data necessary for qualification and qualification retention, nor will such data be listed on the DD Form 1423.

4.3.5 Rights in data. The acquisition of rights in technical or other data shall not be made through the medium of a specification. See DOD FAR Supplement, Part 27, Subpart 27.4, for procedures for obtaining such rights through appropriate contract clauses.

4.3.6 Use of copyright or patent material. Copyright or patent material shall not be included in a specification without the prior consent of the copyright or patent owner. When such consent is obtained, a credit line, if requested by the copyright or patent owner, shall be placed in the specification close to the material involved.

4.4 Part or Identifying Number (PIN). When a military specification covers more than one part, item, or material that is subject to assignment of National Stock Numbers and an identification problem in the Federal Supply System may result, a specification-based PIN to identify the parts, items, or materials shall be included. If a PIN is needed, its construction shall be provided by the DoD activity requiring it. PIN's shall be kept short and shall not exceed 15 characters. If it is considered that such a limitation cannot be adhered to, a proposed deviation with detailed justification shall be submitted through the DepSO to DPSO for approval. PIN's shall be uniform for all parts covered by the same specification. Uniformity is also preferred for all PIN's within the same group of closely related items. PIN's for material shall be assigned in the same product increments as the items to be stocked, and shall specify the various commercially available sizes and other sizes, as needed. PIN's need not be applied retroactively to specifications wherein a part numbering system is already in use; however, the adoption of a PIN should be considered upon revision of such specification. When using "Used in lieu of" documents, the "00" prefix shall not be included as a part of the PIN.

a. For stand alone specifications, the part numbering system shall be as follows:

M 12345 - 1 Example of PIN: M12345-1

Dash number consisting of numbers, letters, or combinations thereof. Codes may be assigned to variable characteristics of the item and used in the makeup of the dash number, (for example, tolerances, materials, temperature ratings, finishes, reliability, etc.).

An alpha code may replace the dash.

Specification number. Does not include the revision letter or activity symbol.

M prefix (Those existing PIN's that use a "D" prefix may continue to do so.)

b. For associated detail specifications or specification sheets, the PIN shall be as follows:

M or MS 23648/ 11 - 1 Example of PIN: M23648/11-1 or MS23648-1

Dash numbers consisting of numbers, letters, or combinations thereof. Codes may be assigned to variable characteristics of the item and used in the makeup of the dash number (for example, tolerances, materials, temperature ratings, finishes, reliability, etc.)

An alpha code may replace the dash.

Associated detail specification or specification sheet number. Does not include the revision letter or activity symbol. Does not apply to MS part number.

General specification number.

M prefix - An item defined by inch-pound units.
MS prefix - An item covered by an existing MS sheet form standard. (Those existing PIN's that use a "D" or "DS" prefix may continue to do so.)

4.5 Type designations. If practicable and a definite need has been established, type designations may be used to supplement basic item names in titles of specifications. When used, they shall be standardized for a category of equipment, such as communication, electronic, photographic, aeronautical support, aircraft, missiles, engines (rocket, reciprocating aircraft), and trucks. Only one type designation shall be assigned for items or equipment physically and functionally interchangeable. Type designations shall not be used for the purpose of assigning a PIN to components and parts. They shall be used for designating the class, grade, or type of an item or equipment for specification purposes only. Existing specifications using type designations shall not be amended for the sole purpose of deleting type designations.

4.6 Systems for type designations. In standardizing type designations, industrial or commercial systems of designations that have industry wide acceptance and are acceptable for military use without modification shall be adopted without establishing military type designations. In the absence of existing widely accepted type designations, the military specification shall establish the methods or systems of type designations and the methods and procedures for assigning them in a category of items or equipment.

4.7 Contractual and administrative requirements. A specification shall not include contractual requirements that are properly a part of the contract, such as cost, quantity required, time or place of delivery, methods of payment, liquidated damages, rework, repair, resubmittal, requirements for preparation,

submission, delivery, approval, and distribution of data, record keeping, and actions to be taken by the Government for accepting nonconforming material. Contractual, administrative, and warranty provisions shall not be made part of the requirements in the specification. Contractual and administrative provisions considered essential for acquisition may be included in section 6 of the specification for information. Parts control program, calibration system, and quality program and inspection systems requirements shall not be included in specifications. The specification also shall not prescribe mandatory requirements or instructions for the Government Contract Administration Office. These include directions relating to quality assurance functions such as inspections, audits, reviews, certifications, and technical approvals.

4.8 Classified material. Specifications are working documents and shall be designed to avoid unnecessary restrictions in their dissemination. Specifications containing classified information shall be appropriately marked and handled in accordance with security regulations. The titles of standardization documents shall not be classified.

4.9 Text. The text shall be written in clear and simple language, free of vague terms or those subject to misinterpretation. Unfamiliar words, words having more than one meaning, and unusual technical and trade expressions shall be avoided. Sentences shall be short. Punctuation shall be used to aid in reading and prevent misreading. Well-planned word order requires a minimum of punctuation. When extensive punctuation appears necessary for clarity, consideration should be given to revising the sentence, since misplaced or omitted punctuation marks can sometimes change the meaning of the sentence. To avoid this possibility, consideration should be given to converting clauses of a compound sentence into separate sentences. All sentences shall be complete and in accordance with the rules of grammar.

4.9.1 Grammar and style. Except where Department of Defense requirements differ, the United States Government Printing Office Style Manual shall be used as a guide for capitalization, spelling, punctuation, syllabification, compounding words, tabular work, and other elements of grammar and style.

4.9.2 Abbreviations. When using abbreviations, those listed in applicable standards shall be used, except that abbreviations in titles of specifications shall be in accordance with Cataloging Handbook H6. The only other abbreviations employed shall be those in common usage and not subject to misinterpretation. Abbreviations for use in specifications and associated documents shall be in accordance with MIL-STD-12, where applicable. Abbreviations not covered by MIL-STD-12 shall be in accordance with the GPO Style Manual. The first time an abbreviation is used in text, it shall be placed in parentheses and shall be preceded by the word or term spelled out in full: for example, circuit (ckt), frequency converter (freq conv), maximum working pressure (mwp). The rule does not apply to abbreviations used for the first time in tables and equations. Abbreviations used in figures and tables, but not referenced in the text or in any other portion of the specification, shall be spelled out in a footnote to the applicable figure or table.

4.9.3 Symbols. The only symbols normally used in text are "+", "-", "±", to express ranges or tolerances, the degree symbol "°", and metric symbols, such as "mm" and "mg." Other symbols may be used in equations and tables and shall be in accordance with IEEE 260. Graphic symbols, when used in figures, shall be in accordance with DoD adopted standards. Any symbol formed by a single character should be avoided if practicable, since an error destroys the intended meaning. Metric symbols need not be spelled out. The symbols for physical quantities (both metric and inch-pounds), often thought of as abbreviations, may be used in accordance with FED-STD-376.

4.9.4 Proprietary names. Trade names, copyrighted names, or other proprietary names applying exclusively to the product of one company shall not be used unless the item(s) cannot be adequately described because of the technical involvement, construction, or composition. In such instances, one, and if possible, several commercial products shall be included, followed by the words "or equal" and a description of required salient features or particular characteristics to ensure wider competition and that bidding will not be limited to the particular make specified. The same applies to manufacturer's part numbers or drawing numbers for minor parts when it is impracticable to specify the exact requirements in the specification. The salient features or particular characteristics required to define "or equal" shall be included. The use of "brand name or equal" is discouraged but, when determined to be necessary, shall be supported by written justification and retained in the permanent document file.

4.9.5 Commonly used words and phrases. Certain words and phrases are frequently used in a specification. The following rules shall be applied:

a. Referenced documents shall be cited thus:

   (1) "conforming to . . ."
   (2) "as specified in . . ."
   (3) "in accordance with . . ."

   In any case, use the same wording throughout a given document and a series of directly related documents.

b. "Unless otherwise specified" shall be used to indicate an alternative course of action. The phrase shall always come at the beginning of the sentence, and, if possible, at the beginning of the paragraph. This phrase shall be used only when it is possible to clarify its meaning by providing a reference such as to section 6 of the specification for further clarification in the contract or reference to another paragraph in the specification.

c. When making reference to a requirement in the specification and the requirement referenced is rather obvious or not difficult to locate, the simple phrase "as specified herein" is sufficient and may be used.

d. The phrase ". . . to determine compliance with . . ." or ". . . to determine conformance to . . ." should be used in place of ". . . to determine compliance to . . . ." In any case, use the same wording throughout.

e. In stating limitation, the phrase shall be stated thus: "The diameter shall be not greater than . . ." for maximum limit, or "The diameter shall be not less than . . ." for minimum limit.

f. Capitalize the words "drawing" and "bulletin" only when they immediately precede the document identifier. However, specifications, standards, and handbooks shall be identified in the text only by their document identifier; for example, MIL-E-000 (not: "specification MIL-E-000").

g. Use the following prepositional phrases when referencing figure and table information: "on a figure" and "in a table".

h. "Shall", the emphatic form of the verb, shall be used throughout sections 3, 4, and 5 of the specification whenever a requirement is intended to express a provision that is binding. For example, in the requirements section, state that "The gauge shall indicate ..." and in the test section, "The indicator shall be turned to zero, and 220 volts alternating current shall be applied." For specific test procedures, the imperative verb form may be used, provided the entire method is preceded by "The following test shall be performed" or similar wording. Thus, "Turn the indicator to zero and apply 220 volts alternating current." "Shall" shall not appear in sections 1, 2, or 6 of the specification.

i. "Will" may be used to express a declaration of purpose on the part of the Government. It may be necessary to use "will" to indicate simple futurity.

j. Use "should" and "may" whenever it is necessary to express nonmandatory provisions. The term "should" is used in section 6 in lieu of "shall".

k. Indefinite terms, such as "and/or," "suitable," "adequate," "first rate," and "best possible" shall not be used. Use of "e.g.," "etc.," and "i.e.," should be avoided.

l. The term "flammable" shall be used in lieu of "inflammable," and "non-flammable" shall be used in lieu of "unflammable" and "noninflammable."

4.10 Use of decimals. Decimals shall be used in documents instead of fractions wherever possible.

4.11 Metric practices. Metric practices shall conform to ASTM E 380 and IEEE 268. When an existing inch-pound (or non-SI metric) standardization document is revised, a decision shall be made as to whether metrication is appropriate, and if so, how to metricate such a document. In general, the following methods shall be used:

a. New parallel document. For very complex documents filled with many conversion-susceptible measurements, the logical method is to issue a new SI metric standardization document following the guidance herein. Great care shall be used to ensure that the new document is hard metric, and that equivalents are carefully selected. After that, the basic document and the metric document would be revised concurrently, until such time as the inch-pound document is no longer required and is canceled.

b. Metric appendix. For less complex documents, or for very complex documents where retention of the original document number is considered necessary, a hard metric appendix may be prepared. The basic document would remain in inch-pound units and refer to the appendix for metric information. The appendix shall refer to the basic document for technical features and cite only the metric equivalents, exercising care to ensure that equivalents are carefully selected.

c. Metric notes. For relatively simple documents with only a few measurement units, metrication may be handled by appropriate notes or by one or more footnotes.

4.11.1 Metric units. The metric units for commonly used quantities shall be in accordance with FED-STD-376. Optimum rationalization shall be achieved in the preparation of standardization documents. Metric sizes will generally be expressed in whole numbers. There shall be no soft conversion of units merely for the sake of conversion. In those instances where an inch-pound item is the primary item in the international marketplace, a document with soft conversion of units can be prepared.

4.11.2 Dual dimensions. The use of both metric and inch-pound measurements on drawings or other pictorial illustrations to be used in a standardization document shall be avoided. The use of tables to translate the specific inch-pound units used to metric equivalents is acceptable. For text material, when preference is given in the standardization document to inch-pound units, acceptable metric units may be shown in parentheses. When preference is given to metric units, inch-pound units may be omitted or included in parentheses. In general, where it has long been standard practice to cite metric units alone (such as citing temperatures only in degrees Celsius), inch-pound equivalents may be omitted. A specific repetitive equivalent, for example 1.00 inch (25.4 mm), need be inserted only the first time it appears in a paragraph of a standardization document.

4.12 Underlining. Portions of paragraphs shall not be underlined and words or phrases shall not be capitalized for the sake of emphasis with the exceptions noted in 4.13.1. All of the requirements are important in obtaining the desired product or service. Preambles and acquisition notes shall not be underlined. Table and figure titles may be underlined (see 4.15.1 and 4.16.1).

4.13 Paragraph numbering. Each paragraph and subparagraph shall be numbered consecutively within each section of the specification, using a period to separate the number representing each breakdown.

Example for section 3 of commodities specification:

Requirements	3.
First paragraph	3.1
First subparagraph	3.1.1
Second paragraph	3.2
First subparagraph	3.2.1
Second subparagraph	3.2.2

Itemization within a paragraph or subparagraph shall be identified by lower-case letters followed by a period to avoid confusion with paragraph numbers. For clarity of text, paragraph numbering should be limited to three sublevels, unless additional sublevels are unavoidable.

4.13.1 Paragraph identification. Each paragraph and subparagraph shall be given a subject identification. The first letter of the first word in the paragraph and subparagraph identification shall be capitalized. Paragraph and subparagraph identifications shall be either underlined, italicized, or bold type.

4.14 Specification identifier and page number. The specification identifier shall be placed on each page; at the upper right corner of the first page and at the upper center of each successive page. On all specifications, except specification sheets, all pages except the first page shall be numbered with consecutive Arabic numbers at the bottom center of each page. On fold-out pages and other pages which must unavoidably be left blank, the page before the blank page shall be numbered with both page numbers, for example, 23/24. Information for page numbering specification sheets is shown in 5.11.7; for amendments in 5.9.11; and for supplements in 5.8.7.

4.15 Tables. A table shall be used when information can be presented more clearly than as text. Elaborate or complicated tables shall be avoided. References in the text shall be sufficiently detailed to make the purpose of the table clear. The table shall be restricted to information pertinent to the associated text. The tables shall be placed immediately following or within the paragraph containing the first reference. If space does not permit, the table may be placed on the following page. If tables are numerous or their locations would interfere with correct sequencing of paragraphs causing difficulty in understanding or interpretation, they may be placed in numerical

order at the end of the specification and before any figures, appendix, or index. Information included in tables shall not be repeated in the text.

4.15.1 Table numbering and title. All tables shall be numbered consecutively throughout the document with Roman numerals in the order of their reference in the text, even if only one table appears in the document, and shall be titled. The word "TABLE" shall be fully capitalized; followed by the Roman numeral and a period; followed by the underlined, italicized, or bold faced title. The first letter of the title shall be capitalized. Table titles shall be centered above the table and shall be on the same line with the table number. If the title is too long to be typed on one line, the second line shall be aligned with the first letter of the title. If a listing or tabulation appears within a paragraph as an integral part of that paragraph, and obviously does not require a title, the listing or tabulation need not be titled.

4.15.2 Table format. Tables shall be boxed in and ruled horizontally and vertically as necessary to ensure clarity of the table contents. Lines may be typed or drawn. The contents of a table shall be organized and arranged to show clearly the significance and relationship of the information. If a table is of such width that it would be impractical to place it in its normal vertical position, it may be rotated counterclockwise 90 degrees. Large tables may be divided and, if possible, printed on facing pages.

4.15.3 Continuation of tables. If a table is continued to additional page(s), a horizontal line shall not be drawn at the end of the page, unless the table is a group or method type that requires a line of separation between the groups. When lengthy group testing is being documented, the group shall not be split and carried to the next page. The entire group shall be completed on one page. When the table is continued to the next page, the title shall be repeated and a dash followed by the word "Continued" at the end of the title; for example, "TABLE II. Qualification inspection - Continued." The entire heading shall be repeated at the top of the page on which the continuation is presented. The table shall be closed with a horizontal line when all information has been entered.

4.16 Figures. A figure shall be clearly related to, and consistent with, the text of the associated paragraph. Dimensioning practices for outline drawings shall comply with ANSI Y14.5M. (Figures should not be confused with numbered and dated drawings, which are discussed in 5.3.2.1.) The figures should be placed immediately following or within the paragraph containing the first reference to the figure. If figures are numerous or their location would interfere with correct sequencing of paragraphs and cause difficulty in understanding or interpretation, they may be placed in numerical order at the end of the specification following any tables and before any appendix or index. If the figure is of such width that it would be impracticable to place it in its normal vertical position, it should be rotated counterclockwise 90 degrees.

4.16.1 Figure numbering and title. Figures shall be numbered consecutively throughout the document with Arabic numerals in the order of their reference in the text, even if only one figure is referenced in the document, and shall be titled. Figures added after the highest numbered figure are assigned the next higher Arabic numeral. The word "FIGURE" shall be in full capitalized; followed by the Arabic numeral and a period; followed by the underlined, italicized, or bold-faced title. Only the first letter of the title shall be capitalized. Figure titles shall be centered below the graphic and, if possible, shall be on the same line with the figure number. If the title of the figure is too long to be typed on one line, the second line shall be aligned with the first letter of the title.

4.16.2 Continuation of figures. Large figures may be broken and, if possible, printed on facing pages. When a figure is continued on the next page, the number and title shall be repeated below the figure with a dash followed by the word "Continued" at the end of the title.

4.17 Footnotes and notes. Footnotes and notes may be used as indicated in 4.17.1 through 4.17.3.

4.17.1 Footnotes to text. Footnotes to the text should be avoided. Their purpose is to convey additional information that is not properly a part of the text. A footnote to the text shall be placed at the bottom of the page containing the reference to it. Footnotes shall be consecutively numbered throughout the specification with Arabic numerals. The Arabic numeral shall also be used to identify the reference in the text.

4.17.2 Footnotes to tables. Footnotes may contain mandatory information that cannot be presented as data within a table. Number footnotes separately for each table as they appear in the table. Footnote symbols such as "1/" and "2/ shall be used and shall be placed immediately following a word and preceding a numeral requiring the footnote. Numbered footnotes are listed in order immediately below the table. Where numerals will lead to ambiguity (for example in connection with a chemical formula), superior letters, daggers, and other symbols may be used.

4.17.3 Notes to figures. Notes to figures are numbered separately from textual footnotes within the document. Drafting or dimensional notes are numbered consecutively and placed below the figure and above the title. The word "NOTES:" is typed in the left margin of the figure and the explanatory information is typed in Arabic number sequence under "NOTES":

Example: NOTES:

1. Dimensions are in millimeters.

2. Inch-pound equivalents are given for information only.

4.18 Foldouts. Foldouts shall be avoided since their use will require special printing and handling procedures, and distribution will be delayed. Whenever possible, lengthy tables shall be reformatted as multiple, single page tables. When foldouts are required, they shall be grouped in one place, preferably at the end of the document (in the same location as figures) and suitable reference to their location shall be included in the text.

4.19 Definitions in specifications. Definitions shall be listed in alphabetical order in section 6. When this is done, a parenthetical phrase reference to the applicable paragraph in section 6 shall follow the terms to indicate the existence of a definition, for example, "(see 6._._)". Where standard definitions exist in DoD documents, the definition should be quoted word for word with a reference to the source.

4.20 Cross-reference. Cross-reference shall be used only to clarify the relationship of requirements within the specification and to avoid inconsistencies and unnecessary repetition. When the cross-reference is to a paragraph or subparagraph within the specification, the cross-reference shall be only to the specific paragraph number. The word "paragraph" shall not appear, for example, "(see 3.1.1)".

4.21 References to other documents. Referencing is the approved method for including requirements in specifications where this eliminates the repetition of requirements and tests that are adequately set forth elsewhere. References shall be restricted to documents that are specifically and clearly applicable to the specification, that are current, and in the case of military specifications, standards, or handbooks, are available from the Department of Defense Single Stock Point (DODSSP). The extent to which each referenced document is applicable shall be indicated in a positive manner in the specification. The specification shall also include any special details, such as type or class, called for by the referenced document. Reference to paragraph number in other documents shall not be made. The reference shall be to a title, method number, specifically identified requirement, or other definitive designation. A document shall not be referenced that has been canceled or superseded. Referenced documents shall be reviewed to ensure that a referenced requirement has not been deleted or modified.

4.21.1 Limitation on references. A specification shall not conflict with provisions in referenced documents unless it is necessary to make special exceptions. In that case, the specific provisions to which exception is made shall be stipulated. Unnecessary reference to other standardization documents and document "tiering" shall be avoided. It is not intended that other documents be made a part of a specification by reference unless the items, materials, tests, or other services in the referenced documents are required in the quality and detail which these documents are designed to produce. Phrases such as "to the extent specified in the contract" or "when required by the statement of work" in imposing referenced documents shall not be used. The applicability of all documents listed in section 2 of a specification shall be detailed in sections 3, 4, or 5, as appropriate. The whole of a listed document shall not be made applicable by reference unless all of its provisions

are required. When a document or portion of a document must be referenced, the extent of its applicability as a requirement or as guidance only shall be specifically indicated. When a reference to a document can be quoted word for word (see 4.3.6) without adversely affecting the technical essence or readability of the specification (normally less than a page in content), it may be quoted without referencing the document in the text and section 2.

4.22 Preparation of manuscripts for reproduction. Manuscripts shall be prepared for reproduction. If composition (typesetting) is required, the approved standardization document manuscript shall be typed either single or double spaced. When photo-offset printing is intended, the standardization document manuscript shall be typed, single spaced on one side only, on 8-1/2 x 11-inch plain white paper. Bond paper (which has a watermark) shall not be used. At the discretion of the preparing activity, military specification sheets (and existing MS sheet form standards) may be prepared on a DD Form 672. When using 8-1/2 x 11-inch paper, a margin of 1 inch shall be left at the sides, top, and bottom.

5. DETAILED REQUIREMENTS

5.1 General. This section contains detailed format requirements for preparing the sections of a specification as well as the associated documents, namely - supplement, amendment, notice, associated detail specification, and the specification sheet.

5.2 First page information. Drafts of proposed military specifications shall carry one of the following notes at the top of the first page, as applicable:

"NOTE: This draft, dated (date) prepared by (preparing activity), has not been approved and is subject to modification. DO NOT USE FOR ACQUISITION PURPOSES. (Project)"

"NOTE: This draft, dated (date) prepared by (name of agent), as agent for (preparing activity), has not been approved and is subject to modification. DO NOT USE FOR ACQUISITION PURPOSES. (Project)"

This note shall be removed from the camera ready master after approval and prior to reproduction.

5.2.1 Heading. Military specifications shall have the heading "MILITARY SPECIFICATION" centered above the title.

5.2.2 Titling the specification. The approved basic or item name of the material, product, or equipment covered by the specification shall be the first part of the title of commodity specifications, specifications for packaging of commodities, or those related to commodities. Item names in titles shall conform to Cataloging Handbook H6. When there is no approved item name, titles for specifications shall be selected on the basis of agreement between standardization and cataloging organizations of the preparing activity. The basic noun in the title shall be in the singular form if the specification covers only one product, and in the plural form if the specification covers more than one product, such as, various types, grades, classes, sizes, or capacities, except where the only form is plural or where the nature of the product requires the plural form. Specification titles shall not begin with numbers. For general specifications, the words "GENERAL SPECIFICATION FOR" shall be the closing phrase of the title. When applicable, the word "METRIC," enclosed in parentheses, shall appear after the title and preceding the words "GENERAL SPECIFICATION FOR."

5.2.2.1 Modifiers. The title of the specification shall include, where appropriate, and in addition to the approved basic or item name, the minimum number of modifiers as necessary to identify the coverage of the specification and to distinguish it from other specifications covering similar items. Non-definitive modifiers shall not be used.

5.2.3 Identification of military specifications. Military specifications shall be identified and dated as specified in the following paragraphs.

5.2.3.1 Coordinated military specification identifications. Coordinated military specifications shall be identified by a specification identifier composed of the letters "MIL" followed by a hyphen and a capital letter (the first letter of the title), and another hyphen and a number (Arabic numbers) (see 4.14). This number is assigned by the preparing activity in accordance with departmental procedures from blocks of numbers allocated to the departments.

Example: MIL-A-123
28 October 1980

5.2.3.1.1 Document identifiers for specifications associated with a general specification. As an exception to the numbering system explained in 5.2.3.1, each associated detail specification or specification sheet, which refers to and is dependent upon a general specification for requirements common to the items covered in several related specifications, shall be identified by the general specification identifier (less revision letter or suffix), and with an additional identification in the form of a serial number indicating its position in order of promulgation added after a virgule, for example, "MIL-B-18/25."

5.2.3.1.2 Date of specification. The date of approval shall appear under the specification identifier on the first page only. Drafts shall not have a date in this location. The space shall be blank until the document is approved.

5.2.3.2 Limited coordination military specification identification. Limited coordination military specifications shall be identified in the same manner as coordinated military specifications, except that a parenthetical suffix to the specification identifier containing the symbol designation of the preparing activity or service shall be added consistent with the degree of coordination of the document. Dates will be assigned as for fully coordinated documents.

Examples:	MIL-A-12345(ER) 23 April 1980	MIL-W-16878E(NAVY) 10 August 1981	MIL-B-34566(USAF) 9 March 1973

5.2.3.3 Identification of "USED IN LIEU OF" limited coordination military specifications. A "USED IN LIEU OF" limited coordination military specification bears the same title as the coordinated military specification on which it is based (see 5.2.2). No more than one "USED IN LIEU OF" specification shall be outstanding per department for any coordinated specification. In addition, such a specification shall be clearly identified through four indicators as follows:

a. The specification number shall be prefixed with two zeros.

b. The next revision letter and the symbol designation of the preparing activity for the "USED IN LIEU OF" specification (see 5.7.4).

c. The notation "USED IN LIEU OF" shall be used instead of "SUPERSEDING" in the supersession information (see example).

d. The preamble set forth on the first page of the specification, under the title (see 5.2.5.3).

Example:

MIL-P-0015280C(SH)
23 April 1980
USED IN LIEU OF
MIL-P-15280B
19 August 1975

5.2.3.4 Measurement system identification. Metric specifications shall be identified by the word "METRIC" placed in a rectangular box above the specification identifier on the first page. Inch-pound specifications shall be identified in a similar manner, except the term "INCH-POUND" shall be used. Similarly, those specifications which can be used in either the metric or inch-pound systems shall be identified by "NOT MEASUREMENT SENSITIVE." Hybrid documents which include a mixture of metric and inch-pound units shall be identified by "INCH-POUND." The "DOD" symbol shall no longer be used to identify specifications which are metric or capable of being used in either measurement system. Those specifications presently identified as "DOD" shall be changed to the "MIL" identifier at the time of next revision. Exceptions to the above will be considered by DPSO on a case-by-case basis.

Examples:

METRIC	NOT MEASUREMENT SENSITIVE	INCH-POUND
MIL-A-123 23 April 1988	MIL-A-123 23 April 1988	MIL-A-123 23 April 1988

5.2.4 Supersession. A coordinated standardization document supersedes all prior issues, revisions, amendments, and notices of that document. With concurrence of the military or federal agencies concerned, other documents may also be superseded by a coordinated document which incorporates essential requirements. Thus, the superseding document reflects a degree or range of coordination equal to or greater than any document which it supersedes. A limited coordination or "Used-in-lieu-of" specification shall not include the term "SUPERSEDING" with respect to an existing coordinated specification in the military series, since coordinated documents remain in effect until canceled or revised with the concurrence of the agencies concerned. A line shall separate the number and date of the superseding document from the supersession data. The word "SUPERSEDING" shall be entered below the separation line, followed by the number and date of the superseded document, indicating that all activities

concerned are to use the superseding document. As illustrated elsewhere in this section, the words "USED IN LIEU OF" are used to introduce revision data applicable to the preparing activity and to others at their option. For example:

MIL-B-12345B
11 August 1973
SUPERSEDING
MIL-B-0012345A(SH)
6 June 1966
MIL-B-12345
16 March 1966
MIL-C-56789B
20 January 1970

When more than three documents are superseded, or when a specification is superseded in part, or when it is desirable to present special information for clarity, the supersession data and special information shall be placed in section 6 of the specification. The following notation shall then appear under or in lieu of supersession:

Example:	Superseding more than three documents:	Example:	Superseding in part:
	MIL-A-123C 20 August 1972 SUPERSEDING (See 6.__)		MIL-A-120C 20 August 1972 SUPERSEDING MIL-A-12345C (IN PART) 4 January 1970 (See 6.__)

When a specification supersedes a document of a different number, the cancellation notice for the superseded document should be processed for issuance simultaneously with the superseding document. The approval dates of the superseding specification and of the cancellation notice should be the same.

5.2.4.1 "Inactive for new design" note. When specifications are made inactive for new design concurrent with a revision action, the following note shall appear below the title and above the preamble on the first page and be boxed for emphasis. Superseding documents for new design shall be noted in the box when applicable.

Inactive for new design after (date) For new design use MIL-X-000.

5.2.5 Preambles.

5.2.5.1 Preamble for coordinated military specifications. For coordinated military specifications, the following preamble shall appear immediately under the title to show promulgation by the Department of Defense:

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

5.2.5.2 Preambles for limited coordination military specifications. For limited coordination military specifications, one of the following preambles, as appropriate, shall appear immediately under the title:

"This specification is approved for use by the (Preparing Activity), Department of the ( ), and is available for use by all Departments and Agencies of the Department of Defense."

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

5.2.5.3 Preamble for "USED IN LIEU OF" specifications. For "USED IN LIEU OF" specifications, the following preamble shall appear immediately under the title:

"This specification is approved for use by the (Preparing Activity) based upon currently available technical information but it has not been approved for promulgation as a coordinated revision of (document identifier). It is subject to modification. However, pending its promulgation as a coordinated military specification, it may be used in acquisition."

5.2.5.4 Preamble for limited coordination military specification with restricted distribution. When a limited coordination military specification is marked with other than "DISTRIBUTION STATEMENT A" (see 5.2.9), the following preamble shall be used:

"This specification is approved for use within the (Preparing Activity), Department of the ( ), and is available for use within the distribution limitations noted below."

5.2.6 DD Form 1426 note. General specifications and detail specifications in six-section format shall include the following note on the bottom center of the first page immediately above the FSC designation. The note shall be boxed for emphasis.

> Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: (insert name and address of the preparing activity) by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

5.2.7 Designation of federal supply class (FSC), group (FSG), or area assignment. The specification shall be assigned an FSC or FSG as defined in the Cataloging Handbook H2-1, Part 1 Groups and Classes, or a standardization area as defined in the Standardization Directory, SD-1. The applicable FSC, FSG, or area assignment shall appear in the lower right corner of the first page of the specification below the beneficial comments box. The symbol "GP" shall follow the FSG number, (for example, 59GP) when the FSG number identifies the assignment or project. Specifications covering more than one FSC shall be designated with the applicable FSG or with the appropriate standardization area if more than one FSG is covered. Dual or multiple FSC, FSG, or standardization area designations shall not be used.

5.2.8 AMSC number. All standardization documents shall reflect either an AMSC number assigned by DDMO or "AMSC N/A" at the bottom left of the first page, above the distribution statement. The following indicates which documents require an AMSC number and which ones require "AMSC N/A."

a. New and revised physical commodity specifications and specification sheets (see 4.3.1) require "AMSC N/A."

b. New and revised data product and technical manual specifications and specification sheets (see 4.3.2 and 4.3.3) require assignment of an AMSC number by DDMO.

c. Amendments require either the same AMSC number or "AMSC N/A" as shown on the document being amended. While amendments do not have to be submitted to DDMO for clearance, a copy of all amendments bearing an AMSC number shall be sent to DDMO concurrent with submittal of the manuscript to the Naval Publications and Forms Center (NPFC) for printing.

d. Validation notices, cancellation notices, reinstatement notices, inactive for new design notices, and supplements require "AMSC N/A."

5.2.9 Distribution statement. All standardization documents prepared by the DoD will cite the appropriate distribution statement in accordance with DoD Directive 5230.24 on the line immediately below the FSC, GP, or area designation flush with the left hand margin. The distribution statement shall be placed on all coordination drafts, as well as the camera ready copy of the document. Except in special situations where there has been prior coordination with the appropriate DepSO and DSPO, the statement for unclassified documents will be as follows:

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

5.3 Sectional arrangement of a military specification. A military specification shall contain six numbered sections, titled and numbered as shown. A table of contents and cover sheets shall not be used. For lengthy documents, an alphabetical index may be used (see 5.6.1).

1. SCOPE

2. APPLICABLE DOCUMENTS

3. REQUIREMENTS

4. QUALITY ASSURANCE PROVISIONS

5. PACKAGING

6. NOTES

Subject matter shall be kept within the scope of the sections so that the same kind of requirements or information will always appear in the same section of every specification. If there is no information pertinent to a section, the following shall appear below the section heading:

"This section is not applicable to this specification."

5.3.1 SECTION 1

5.3.1.1 Scope. The statement of the scope shall repeat the item name and its modifiers and consist of a clear, concise abstract of the coverage of the specification and may include, whenever necessary, information as to the use of the item other than specific detailed applications covered under "Intended use" (section 6). This brief statement shall be the beginning paragraph in section 1 of the six-section specification. As applicable, reference may be made to information contained in section 6 (see figure 3). The scope shall not contain requirements which should be a part of section 3. The scope shall be written so as to function as an abstract in accordance with ANSI Z39.14. Figures shall not be included in the scope.

5.3.1.2 Classification. Designation of classification such as types, grades, and classes, when applicable, shall be listed under this heading in section 1 and shall be in accordance with accepted industry practice. The same designation shall be used throughout the specification. When more than one type, grade, class, or other classification is listed, each shall be briefly defined. When only one classification is covered, a statement to this effect shall be included in the scope paragraph, and the classification paragraph omitted. The classification shall remain constant from revision to revision of the specification unless a change is necessitated by a valid reason such as a change in industry practice. Where the characteristics of an item change enough to affect interchangeability, delete the original designation and add a new classification. Whenever it becomes necessary to change the designation without changing the characteristics of the item, a cross reference shall be included in section 6 of the same specification indicating the relationship between the old and new designations. This cross-reference shall be retained in section 6 in all successive revisions identifying designations in all revisions since the original designation change. Since such changes require cataloging and other record changes, such changes shall be kept to a minimum.

5.3.1.2.1 Other classifications. If the terms, types, grades, and classes do not serve accurately to classify the differences as indicated above, other terms such as color, form, weight, size, power supply, temperature rating, condition, unit, enclosure, rating, duty, insulation, kind, and variety are suitable.

5.3.1.3 Classification for reliability level identification. When a specification contains a multilevel reliability requirement, section 1 of the specification shall identify the levels covered.

5.3.1.4 Use of international standardization agreement code numbers. In designating the classification, the appropriate NATO or other international standardization agreement code numbers shall be included in section 1 whenever the specification requirements are consistent with such an agreement.

5.3.2 SECTION 2

5.3.2.1 Listing of applicable documents. Section 2 shall list only those documents referenced in section 3, 4, and 5 of the specification (see figure 4). Government specifications, standards, adopted non-Government standards, international standardization documents, handbooks, drawings, and approved publications may be referenced in military specifications. Other non-Government documents promulgated by non-Government standards bodies may also be referenced. Government regulations or codes, such as Federal Insecticide, Fungicide, and Rodenticide Act, Drug and Cosmetic Act, Federal Hazardous Substances Labeling Act, Atomic Energy Act, and Department of Transportation regulations shall be referenced where applicable. Military Activity Regulations (for example, AR 702-3, Army Material Reliability, Availability, and Maintainability (RAM)) and other documents not readily available from or through the contracting activity shall not be referenced in the specification. Care shall be taken in referencing non-Government publications to ensure the availability of copies and prior approval of the copyright owner. References shall be confined to current documents readily available at the time of issuance of the specification. Figures bound integrally with the specification shall not be listed in section 2 unless they are reduced-size copies of drawings provided in the specification for information only and use of the full size drawings is normally required with the specification.

5.3.2.1.1 Government documents. Referenced Government specifications, standards, and handbooks shall be listed by document title and identifier excluding revision letters (unless otherwise specified), or suffix (preparing activity symbols) and the "OO" designation for "USED IN LIEU OF". Titles shall be taken from the documents rather than an index. Government specifications, standards, handbooks, drawings, and publications as applicable shall be listed numerically (except federal specifications which shall be listed alpha-numerically) under these headings and in individual groups such as federal, military, and departmental activity (such as Naval Air Systems Command). These listings shall be included under the following subparagraphs:

"2.1 Government documents.

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

The following types of publications shall be listed (as applicable) in the order shown after 2.1.1:

Federal Specifications
Military Specifications
Federal Standards
Federal Information Processing Standards
Military Standards
Military Handbooks

If a general specification has associated detail specifications or specification sheets (including MS sheet form standards) not exceeding five in number, these specifications shall be listed by exact title in numerical sequence. For specifications having six or more associated detail specifications, specification sheets, or MS standards, the supplement shall be identified by a note in 2.1.1 following the military specification listing (see 5.8).

"(See supplement 1 for list of associated specifications.)"

"(See supplement 1 for list of MS sheet form standards.)"

The following parenthetical source statement shall follow the listing of Government specifications, standards, and handbooks:

"(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Naval Publications and Forms Center, (ATTN: NPODS), 5801 Tabor Avenue, Philadelphia, PA 19120-5099.)

If Federal Information Processing Standards (FIPS) are listed under 2.1.1, the following parenthetical source statement shall also appear:

"(Copies of the Federal Information Processing Standards (FIPS) are available to Department of Defense activities from the Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120-5099. Others must request copies of FIPS from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161-2171.)"

The following paragraph shall be used to list Government drawings, publications, or other Government documents not listed under 2.1.1:

"2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation."

The following types of publications shall be listed (as applicable) in the order shown after 2.1.2:

Other Government Documents (for example, Department of Transportation Specifications, U.S. Department of Agriculture Specifications, etc.)
Drawings
Publications

Where detailed drawings referred to in a specification are listed in an assembly drawing, it is only necessary to list the assembly drawing.

A parenthetical source statement shall follow each individual document or each group of related documents providing the name and address of the source.

5.3.2.1.2 Non-Government standards and other publications. Non-Government standards and other publications including DoD adopted documents not normally furnished by the Government shall be listed in appropriate order (numerically or alpha-numerically) under the headings of the respective non-Government standards bodies. The document(s) shall be listed by title and identifier, if applicable. Titles shall be taken from the document rather than from an index. If the non-Government standard has been adopted by the DoD and listed in the DODISS, the specific issue date or other revision indicator shall not be given. If the non-Government standard has not been adopted by the DoD, the specific issue date or other revision indicator may be given, but it is not required. This listing shall be included under the following subparagraph:

"2.2 Non-Government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2)."

In addition, the following parenthetical source statement shall follow each individual publication or each group of related publications which may be obtained from a common source:

"(Application for copies should be addressed to the (name and address of the source).)"

The following source paragraph shall be placed at the bottom of the list when applicable.

"(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.)"

5.3.2.1.3 Order of precedence. In order to avoid confusion in the possible conflict between the requirements of the specification and the documents referenced therein, the following statement shall be included:

> "2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related associated detail specifications, specification sheets, or MS standards), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained."

The parenthetical phrase "(except for related associated detail specifications, specification sheets, or MS standards)" shall be omitted from the above paragraph for specifications which do not have related associated detail specification, specification sheets, or MS standards.

5.3.3 SECTION 3

5.3.3.1 Requirements. Section 3 of the specification shall state the necessary requirements for obtaining the product for which the specification is prepared. Figure 1 lists some possible requirements to be considered when preparing a specification. The requirements shall represent the actual essential needs of the Government to satisfy the intended use and application. Care shall be exercised to ensure that the stated essential needs result in acquisition of acceptable quality products at the least life cycle cost to the Government. Requirements shall be described in a manner to encourage competition and to avoid restrictive features which would limit acceptance to one or a relatively few contractors. Requirements shall be so worded as to provide a definite basis for rejection when testing and examination of product reveals the product does not meet the specification requirements. Unrealistic or ambiguous requirements and those which conflict with referenced documents shall not be used (see figure 5).

a. When preparing a general specification, section 3 shall contain all the requirements that are common to the item being specified. Where specification sheets are to be prepared, the applicable general specification shall include the following paragraph in section 3:

   "3.1 Specification sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheet. In the event of any conflict between the requirements of this specification and the specification sheet, the latter shall govern." (If a specific requirement specified herein is not required for an item, it shall be so indicated on the specification sheet; for example, "Shock - N/A.").

   Use the title "Associated detail specifications" or "MS sheets" in place of "Specification sheets" when applicable.

b. When preparing a six-section-format specification that has no associated detail specifications, specification sheets, or MS sheets, the first paragraph under requirements may be qualification, first article, materials, or chemical composition, as appropriate.

c. When preparing an associated detail specification that references a general specification, section 3 shall contain the requirements only for the particular type covered by that specification. If the specification does cover more than one type, class, or grade, it shall first specify the general requirements for all types, classes, or grades. The differentiating requirements may then be specified for the individual types, classes, or grades, in the proper sequence. Each requirement shall be covered in a separate paragraph. Where one requirement differs for the various types, classes, or grades, a separate paragraph immediately following the general requirements shall be devoted to each type, class, or grade. When it is necessary to

include additional data, descriptive and appropriate headings shall be used and assigned in logical order.

d. When preparing a packaging specification covering packaging of items or materials, section 3 shall be prepared in the format similar to that prescribed for section 5 of a commodity specification except that the general requirements are stated first.

5.3.3.1.1 Sequencing of requirements and tests. When possible, for ease of reference, the test paragraphs in section 4 shall be placed in the same sequence as the requirement paragraphs in section 3. This sequence may be in the order the testing is required. But if this is the case, a requirement to this effect must be placed in the first article or qualification inspection paragraph. An example of sequencing of requirements and tests is as follows:

Requirement		Test	
3.6	Shock	4.7.1	Shock
3.7	Vibration	4.7.2	Vibration
3.8	Noise	4.7.3	Noise
3.9	Electromagnetic interference	4.7.4	Electromagnetic interference

5.3.3.2 Qualification. Where qualification of the product has been properly authorized, the requirement for qualification shall be specified in section 3 of the specification. The following statement shall appear in each specification requiring qualification:

"3. Qualification. (Item) furnished under this specification shall be products which are authorized by the qualifying activity for listing on the applicable qualified products list at the time of award of contract (see 4._ and 6._)."

5.3.3.3 First article. First article includes preproduction models, initial production samples, test samples, first lots, pilot models, and pilot lots. Where it is essential that a first article be tested for conformance with specification requirements prior to regular production on a contract, the requirement shall be specified in section 3 under the appropriate paragraph identification. Where it is essential to determine a manufacturer's current knowledge and manufacturing ability of survival and safety equipment such as life rafts, life preservers, personnel parachutes, ejection seats, cockpit capsules, protective flight clothing, and oxygen breathing equipment, the requirements to perform first article inspection in addition to qualification inspection may be included in specifications for such items. First article inspection is to be performed in connection with production contracts only. The additional inspection shall not be construed as requalification or acceptance of subsequent production items. The following statement shall be

tailored as appropriate for the product involved and appear in each specification requiring first article inspection:

> "3. First article. When specified (see 6._), a sample shall be subjected to first article inspection (see 6._) in accordance with 4._."

5.3.3.4 Standard sample. A standard sample is one considered essential to supplement or illustrate certain requirements of the specification. Use of standard samples shall be kept to a minimum, since their use can create problems in determining the acceptability of items subsequently produced. Adequate inspection requires that all requirements be made available such as the approved tolerances of dimensions or performance. A standard sample does not provide all this information but must be supported by specification requirements and drawings. The use of the standard sample shall be limited to the illustration of qualities and characteristics that cannot be readily described because detailed test procedures or design data are not available, or because certain qualities and characteristics cannot be definitively expressed, such as the texture of fur, the color of cloth, or the grain of wood. Further, the specification should state the specific characteristics and the degree to which these characteristics are to be observed in the standard sample. When a standard sample is to be furnished, it shall be so stated in section 3. Standard samples are either on view or the means of obtaining standard samples shall be specified in section 6.

5.3.3.5 Toxic products and formulations. Specifications containing references to toxic products and formulations shall require compliance with the requirements of the applicable regulations promulgated by the appropriate federal regulatory agency or the official abstract governing such products and formulations. Where it is advisable or necessary for the departmental medical service to determine the safety of the material or the health of personnel, the following requirement shall be included in the specification, including those specifications with qualification requirements:

> "The material shall have no adverse effect on the health of personnel when used for its intended purpose. Questions pertinent to this effect shall be referred by the contracting activity to the appropriate departmental medical service who will act as an advisor to the contracting agency."

5.3.3.5.1 Volatile organic compounds (VOC's). VOC's are restricted by various regional air quality districts as a result of restrictions in the National Clean Air Act. Specifications shall not be written for products containing more than that allowed in the most restrictive air pollution control district. In addition, specifications shall state the maximum VOC content allowed. If special requirements exist, contact DPSO.

5.3.3.6 Hazardous material. Hazardous items are substances, mixtures, materials, components, or equipments that may cause personal injury, property damage, or environmental deterioration through transportation, use, or disposal. These items shall be marked in accordance with the requirements of public law and regulations. The marking shall include as applicable: Name of product; quantity; warning symbol; signal word designating degree of hazard; affirmative statement of hazards; precautionary measures covering actions to be followed or avoided; instructions in case of contact or exposure; antidotes and notes to physicians; instructions in case of fire, spill, or leakage; instructions for handling and storage; and disposal instructions. Characteristics and operating hazards that require labeling include: toxic, high toxic, irritant, corrosive, strong sensitizer, combustible liquid, flammable, extremely flammable liquid, dangerously reactive, pressure-generation, explosive, magnetic, ionizing radiation, non-ionizing radiation, high voltage, implosion, noise, and etiologic agent. Marking of hazardous materials shall be in conformance with 5.3.5.3.1.3.

5.3.3.7 Recycled, reclaimed, and virgin materials. Except when intended use of the item will be jeopardized by the use of reclaimed or recycled materials, in preparing new and revising or amending specifications, preparing activities will ensure that:

a. There is no exclusion to the use of recovered materials.

b. There is no requirement that an item be manufactured from virgin materials.

c. Within 1 year from the date of issue by the Environmental Protection Agency of guidelines designating items which are or can be produced with recovered materials, specifications for such products require the use of recovered materials to the maximum extent possible.

5.3.3.8 JAN and J marking. The following paragraph shall be included when JAN marking is required:

> "The United States Government has adopted, and is exercising legitimate control over the certification marks "JAN" and "J", respectively, to indicate that items so marked or identified are manufactured to, and meet all the requirements of military specifications. Accordingly, items acquired to, and meeting all of the criteria specified herein and in applicable specifications shall bear the certification mark "JAN" except that items too small to bear the certification mark "JAN" shall bear the letter "J". The "JAN" or "J" shall be placed immediately before the part number except that if such location would place a hardship on the manufacturer in connection with such marking, the "JAN" or "J" may be located on the first line above or below the part number. Items furnished under contracts or orders which either permit or require deviation from the conditions or requirements specified herein or

in applicable specifications shall not bear "JAN" or "J". In the event an item fails to meet the requirements of this specification and the applicable specification sheets or associated detail specifications, the manufacturer shall remove the "JAN" or the "J" from the sample tested and also from all items represented by the sample. The "JAN" or "J" certification mark shall not be used on products acquired to contractor drawings or specifications. The United States Government has obtained Certificate of Registration Number 504,860 for the certification mark "JAN"."

5.3.3.9 Government-furnished property. All property to be furnished by the Government as part of the specification shall be listed and identified by part or identifying number, or stock number. The quantity of each item required for one complete unit shall be listed. Each item entry shall be numbered in order to provide ready reference. The specifications or drawings covering Government-furnished property need not be listed in section 2. Documents listed in section 2 of a specification are not considered Government-furnished property (see 5.3.6.12).

5.3.3.10 Government-loaned property. Property that the Government loans to the contractor for testing or any other purpose and which does not lose its identity by becoming part of the commodity shall be listed under this heading (see 5.3.6.12).

5.3.4 SECTION 4

5.3.4.1 Quality assurance provisions. Section 4 shall include all inspections (by reference when applicable) to be performed in order to determine that the item or service to be offered for acceptance conforms to the requirements in sections 3 and 5 of the specification (see figure 6).

5.3.4.2 Responsibility for inspection. The Department of Defense concept of quality assurance is predicated on the fact that responsibility rests upon the contractors for controlling product quality and for offering to the military services for acceptance only those items or lots of items that conform to all contractual requirements. See also 4.7 for the complete exclusion of administrative and contractual clauses not properly a part of the specification. Accordingly, the contractor's responsibility shall be clearly stated by including the following statements as the initial paragraphs in section 4:

> "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 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."

5.3.4.3 Classification of inspections. Where section 4 of the specification includes inspections applicable to such requirements as qualification or first article, a classification of inspections shall be included as the second paragraph of section 4, as illustrated in the following examples:

Example A:

> "4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. Qualification inspection (see 4.3).

b. Quality conformance inspection (see 4.4)."

Example B:

"4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.4).

b. Quality conformance inspection (see 4.5)."

5.3.4.4 Toxicological product formulations. When section 3 of the specification specifies a requirement for review of the toxicological product formulations (see 5.3.3.5), the following is an example of the statement that shall be included in section 4.

"The contractor shall have the toxicological product formulations and associated information available for review by the contracting activity to evaluate the safety of the material for the proposed use."

5.3.4.5 Inspection conditions. When applicable, the environmental conditions under which all inspections (qualification, first article, quality conformance, or other inspections) are performed shall be specified as follows:

"4.3 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified in (applicable test method document or applicable paragraph(s) in the specification)."

5.3.4.6 First article inspection. When section 3 of the specification specifies a requirement for a first article, section 4 shall include a description of the inspection routine, sequence of the inspections, number of units to be inspected, and the criteria for determining conformance to the requirement specified.

5.3.4.7 Qualification inspection. When section 3 of the specification specifies a qualification requirement, section 4 shall include a description of the testing routine, sequence of tests, number of units to be tested, data required and the criteria for determining conformance to the qualification requirement.

5.3.4.8 Retention of qualification. Section 4 shall also include the description of specific actions required for retention of qualification. The nature of the commodity, the industry involved, and the usage of the commodity will determine one of the following actions:

a. Periodic feedback of test data including frequency of submittal.

b. Complete requalification testing including frequency. Where multi-level reliability requirements are specified, the inspection provision applicable to qualification shall cover inspection for each level of qualification as well as for periodic qualification reevaluation.

c. Certification by the manufacturer.

5.3.4.9 Tabulation of examinations and tests. When the tests specified for such qualification inspection requirements differ from the tests specified for quality conformance, the applicable tests shall be presented in tabular form with appropriate reference to corresponding technical requirements and test methods.

5.3.4.10 Quality conformance inspection. The examination and tests listed in section 4 of the specification to determine conformance with sections 3 and 5 requirements, shall include, when necessary, a measurement or comparison with specified characteristics and checks and tests of the performance and reliability requirements. Since each specification item must meet all sections 3 and 5 requirements, the test methods in section 4 of the specification are the minimum inspection and test methods to be performed to demonstrate compliance to the specification requirements.

5.3.4.10.1 Quality conformance inspection sampling. Sampling inspection procedures are valuable tools and are acceptable for verification of contract requirements. However, specific sampling procedures shall not be included as specification requirements. Acceptable quality levels and lot tolerance percent defectives shall not be included as specification requirements. Guidance to the contracting officer regarding the selection and use of specific sampling and acceptance procedures may be included in section 6.

5.3.4.11 Classification of quality conformance inspections. Quality conformance inspections should be classified into groups A, B, C, or D in accordance with the following groupings, when applicable:

Group A - Nondestructive inspections of all items produced or all samples from an inspection lot to demonstrate product compliance with contractual requirements. Group A inspection examines characteristics most affected by variations in production processes or skills and functions vital to successful completion of the design mission.

Group B - Generally nondestructive inspections that are more complex or of a longer duration than group A inspection. Group B inspection examines characteristics more affected by part or equipment quality and less affected by variations in production processes or skills, and functions requiring special fixtures or environments, and tests that are more complex and of longer duration than group A tests. Fewer samples are inspected than

for group A inspection and tested articles may be offered for acceptance with little or no refurbishment. Each commodity should be individually evaluated regarding its issue after performing group B and C inspections.

Group C - Periodic and generally destructive tests of characteristics depending upon product design and materials. Group C inspection consists of more complex tests, usually including simulated service environments, is generally destructive, or may require major refurbishment before tested articles can be used by the services. Tests are performed on fewer samples than for group B inspection and are based on production quantities or time period.

Group D - Destructive tests or tests of long duration that consume all or a considerable portion of design service life. Articles subjected to group D inspection shall not be issued. Tests are performed on few samples based on production quantities or time period.

5.3.4.12 Tabular listing of quality conformance inspection. Where it will lead to a better understanding of their functions, the inspection shall be listed as group A, B, C, or D in tabular form with appropriate references to the applicable requirements, and examination or test methods as illustrated below:

"4.4 Quality conformance inspection. Quality conformance inspections shall be as specified in table II.

TABLE II. Quality conformance inspection.

Inspection	Requirement paragraph	Test paragraph
Group A		
Dimensions	3.4.1	4.4
Visual	3.4.2	4.5
Group B		
Barometric pressure	3.5	4.7.1
Temperature cycling	3.8	4.7.4
Group C		
Vibration	3.6	4.7.2
Salt spray (corrosion)	3.7	4.7.3
Shock	3.9	4.7.5
Moisture resistance	3.10	4.7.6
Group D		
Life	3.12	4.7.8

"

5.3.4.13 Inspection of packaging.

a. An example of the paragraph to be used for commodity or product specifications containing detailed packaging requirements is as follows:

> "4._._ Inspection of packaging. Except when commercial packaging is specified, the sampling and inspection of the preservation and interior package marking shall be in accordance with groups A and B quality conformance inspection requirements of MIL-P-116. The sampling and inspection of the packing for shipment and storage shall be in accordance with the quality assurance provisions of the applicable container specification shown in section 5. The inspection of marking for shipment and storage shall be in accordance with MIL-STD-129. The inspection of commercial packaging shall be as specified in the contract (see 6.2)."

b. In instances where the packaging requirements are covered by a reference to a packaging specification, the paragraph shall be worded similar to the following example:

> "4._._ Inspection of packaging. The sampling and inspection of the preservation, packing, and container marking shall be in accordance with the requirements of MIL-S-28786."

5.3.4.14 Classification of defects. When applicable, classification of defects in accordance with the definitions of MIL-STD-109 shall be included in section 4.

5.3.4.15 Numbering of defects. When required for reference purposes in reporting inspection results, the defects in a classification shall be numbered only in accordance with the following:

1 through 99 - critical defects
101 through 199 - major defects
201 through 299 - minor defects

If additional groupings are required, they shall be numbered in the 301, 401, 501, etc., series. If the number of defects in any group exceeds 100, the series should start over with a letter suffix; such as, 101a, 102a, 103a.

5.3.4.16 Methods of inspection. Description of the tests and methods of analysis for first article inspection, qualification, quality conformance, or other inspections shall be covered in section 4 of the specification to the extent necessary to ensure conformance to each requirement in sections 3 and 5 therein and to ensure that the tests are properly conducted. These descriptions will either be included under the general heading "Methods of inspection" with reference to methods in other portions of the specification, or where appropriate for proper classification of the examinations and tests, under the

inspection heading to which the tests apply. The descriptions shall include location and number of tests, testing equipment and materials, testing routine, number of samples to be tested, and criteria for determining conformance to these requirements. Test methods appearing in standards and other appropriate standardization documents shall be included only by reference. However, the various options specified in the applicable test method standards which are required to be specified in the individual equipment specification, associated detail specifications, specification sheets or MS sheets shall be covered.

5.3.5 SECTION 5

5.3.5.1 Packaging. The requirements for preservation, packing, and marking shall be included in section 5 of the specification (see 5.3.5.4 and figure 7). Packaging is the processes and procedures used to protect materiel from deterioration and damage. It includes cleaning, drying, preserving, packing, marking, and unitizing. The levels of preservation and packing shall conform to established policy governing their specification and use. The packaging specified shall be adequate, but not greater than necessary to fully meet the criteria of MIL-STD-2073-1 for the particular level of protection required. Military packaging shall be detailed as level A, B, or C. Commercial packaging, identified as such, may be used when something less than military levels is acceptable.

5.3.5.2 Specific requirements. The specific requirements for materials to be used in the packaging of a product or commodity shall be covered in section 5, either directly or by reference to other specifications, drawings, or publications.

5.3.5.3 Inspection. Inspection of the preservation, packing, and container marking of the items or commodities concerned shall be specified in section 4 (see 5.3.4.13).

5.3.5.3.1 Preparation. Requirements may be included by reference to other specifications and applicable standards or, where these do not exist or are not applicable, by detailed instructions. The requirements shall be included with appropriate heading as required, for disassembly, cleaning, drying, preservation, packing, marking, unitization, and transportability. These requirements shall be specifically related to each required level of packaging in a manner which will leave no doubt regarding requirements applicable to such level. Detailed packaging requirements shall be covered so far as practicable in the following basic categories.

5.3.5.3.1.1 Preservation. The requirements for preservation shall include, as applicable, the application or use of protective measures including appropriate cleaning, drying, preservatives, unit packs, wrapping, cushioning, blocking, bracing, intermediate containers, and identification marking up to but not including the exterior packs, to adequately prevent deterioration or misidentification of the items. Levels A, B, and C will normally constitute the levels of protection. When it is known that a given item will be used under conditions where level A would be in excess of the requirement for protection and would entail unnecessary costs and where level C would be inadequate, detailed requirements for level B will be included (see 5.3.6.10). When any lower level of preservation or packing is the same as that shown for a higher level, the lower level shall not be indicated.

5.3.5.3.1.2 Packing. The requirements for packing shall cover the exterior shipping container, the assembly of items or packs therein, necessary blocking, bracing, and cushioning. Container selection for packing shall provide for use of containers of minimum weight and cube consistent with anticipated storage and shipment hazards. The requirements for levels of packing shall be included in the specification.

5.3.5.3.1.3 Marking. Marking shall be in accordance with the requirements of MIL-STD-129 for military levels of protection. Commercial packaging shall be marked as prescribed. Other markings shall be applied as required by other DoD documents governing specific commodities, as well as Federal statutes and regulations, such as, Federal Hazardous Substance Labeling Act. Anti-counterfeiting considerations shall be addressed where appropriate, including the company logo as an acceptable method of identification.

5.3.5.3.1.4 Marking for shipment. Normally, marking requirements shall be established by reference to MIL-STD-129. Those markings essential to safety and to the protection or identification of the item which are not required by MIL-STD-129 or are required on a "when specified" basis by the standard shall be specified in detail under this heading. When civil agencies (such as NASA or GSA) are listed in the concluding material, FED-STD-123 shall be designated on a "when specified" basis as the marking standard for shipment. When section 3 requires specific item marking on unit packs, the requirements for that marking shall be included in section 5 with reference made to the section 3 requirement.

5.3.5.4 Commodity (product) specifications covered by packaging specifications. Some commodity (product) specifications are covered by packaging standardization documents for the particular items or FSC included in the commodity specification. To prevent conflicting and redundant requirements, the commodity specification shall only reference the packaging standardization document specifically developed to cover the item(s) concerned. The following shall be used for section 5 when a commodity specification is covered by a packaging standardization document.

"5. PACKAGING.

5.1 Packaging requirements. The requirements for packaging shall be in accordance with (specify the packaging standardization document).

5.3.6 SECTION 6

5.3.6.1 Notes. The information provided in section 6 is not contractually binding. Section 6 shall only contain information of a general or explanatory nature, and no requirements shall appear therein (see figure 8). It shall contain information designed to assist in determining the applicability of the specification and the selection of appropriate type, grade, or class of the commodity, additional supersession data, changes in product designation such as grades or class, standard sample (if required), and other information deemed appropriate. This section shall include the following in the order listed, as applicable:

a. Parenthetical note.

b. Intended use.

c. Acquisition requirements.

d. Data requirements.

e. Inspection for first article.

f. Standard sample.

g. Qualification.

h. Supersession data (see 5.2.4).

i. Definitions (see 4.19).

j. Cross-reference of classifications and substitutability data.

k. Conditions for use of Level B preservation.

l. Environmental pollution preventive measures.

m. Government-furnished and Government-loaned property.

n. Material safety data sheets.

o. Patent notice.

p. Part or identifying number (PIN) structure.

q. Subject term (key word) listing.

r. International interest.

s. Identification of changes.

5.3.6.2 Parenthetical note. The following parenthetical note shall appear immediately below "6. NOTES":

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

5.3.6.3 Intended use. Information relative to the use of the item covered by the specification shall be included under this heading. The difference among types, grades, and classes in the specification shall be explained herein. If there are any particular applications for which the item or material is not well adapted, this information shall also be included.

5.3.6.4 Acquisition requirements. This paragraph shall list all the options which must be exercised by the contracting officer in invitations for bids, contracts, or other purchasing documents. Options shall be listed in the sequence in which they appear in sections 3, 4, and 5. Acquisition requirements shall appear as 6.2 and shall include the following information as a minimum:

"6.2 Acquisition requirements. Acquisition documents must specify the following:

a. Title, number, and date of the specification.

b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.__)."

5.3.6.5 Consideration of data requirements (see 4.3).

a. When the specification is prepared to address physical commodities, and data requirements may need to be considered for inclusion on the Contract Data Requirements List (DD Form 1423), the following paragraph shall be inserted in section 6 of the specification:

"6.3 Consideration of data requirements. The following data requirements should be considered when this specification is applied on a contract. The applicable Data Item Descriptions (DID's) should be reviewed in conjunction with the specific acquisition to ensure that only essential data are requested/provided and that the DID's are tailored to reflect the requirements of the specific acquisition. To ensure correct contractual application of the data requirements, a Contract Data Requirements List (DD Form 1423) must be prepared to obtain the data, except where DOD FAR Supplement 27.475-1 exempts the requirement for a DD Form 1423.

Reference Paragraph	DID Number	DID Title	Suggested Tailoring
.	.	.	.
.	.	.	.
.	.	.	.

The above DID's were those cleared as of the date of this specification. The current issue of DOD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL), must be researched to ensure that only current, cleared DID's are cited on the DD Form 1423."

b. When the specification is prepared to address physical commodities that are weapon systems, weapon system components, or weapon system support equipment, and there may be a need to acquire technical manuals, the following shall be inserted in section 6 of that specification:

"6.4 Technical manuals. The requirement for technical manuals should be considered when this specification is applied on a contract. If technical manuals are required, military specifications and standards that have been cleared and listed in DOD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL) must be listed on a separate Contract Data Requirements List (DD Form 1423), which is included as an exhibit to the contract. The technical manuals must be acquired under separate contract line item in the contract."

c. When the specification is prepared to address a data product (with the exception of technical manuals), the following shall be inserted in section 6 of that specification:

"6.3 Data requirements. The following Data Item Descriptions (DID's) must be listed, as applicable, on the Contract Data Requirements List (DD Form 1423) when this specification is applied on a contract, in order to obtain the data, except where DOD FAR Supplement 27.475-1 exempts the requirement for a DD Form 1423.

Reference Paragraph	DID Number	DID Title	Suggested Tailoring
.	.	.	.
.	.	.	.
.	.	.	.

The above DID's were those cleared as of the date of this specification. The current issue of DOD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL), must be researched to ensure that only current, cleared DID's are cited on the DD Form 1423."

d. When the specification is prepared to address technical manuals for the installation, operation, maintenance, training, and support of weapon systems, weapon system components, and support equipment, the following shall be inserted in section 6 of that specification:

"6.3 Technical manual acquisition. This specification must be listed on the Contract Data Requirements List (DD Form 1423) in order to acquire the technical manuals described by this specification, except where DOD FAR Supplement 27.475-1 exempts the requirement for a DD Form 1423."

5.3.6.6 Inspection for first article. If section 3 of the specification specifies a first article inspection, instructions for the contracting officer shall be included regarding the arrangements for the details concerning the first articles. For example:

"6._ First article. When first article inspection is required, the contracting officer should provide specific guidance to offerors whether the item(s) should be a preproduction sample, a first article sample, a first production item, a sample selected from the first ___ production items, a standard production item from the contractor's current inventory (see 3.__), and the number of items to be tested as specified in 4.__. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results, and disposition of 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."

5.3.6.7 Standard sample. If section 3 of the specification specifies a standard sample in accordance with 5.3.3.4, information for obtaining and examining the standard sample (source and address) shall be stated under this paragraph identification.

5.3.6.8 Qualification. Where qualification of a product is a requirement of the specification, information concerning such qualification shall be stated in this section as follows:

"With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Products List QPL No._____ whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and

manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. The activity responsible for the Qualified Products List is (insert name and address of preparing activity) and information pertaining to qualification of products may be obtained from that activity."

NOTE: At the option of the preparing activity, where an agent has been delegated authority to administer the Qualified Products List, the following may, be substituted for "and information pertaining to qualification of products may be obtained from that activity":

"however, information pertaining to qualification of products may be obtained from (insert name and address of agent)."

5.3.6.9 Cross-reference. A cross-reference of old to new military classification or part number, made by specification revision showing substitutability relationship, shall be included. The extent to which new items may be binned with or substituted for prior items shall be stated here.

5.3.6.10 Level B preservation. Whenever level B preservation is incorporated in the specification, the condition under which this level is to be specified shall be explained under this heading. An example of the wording of this paragraph is as follows:

"6._ Conditions for use of level B preservation. When level B preservation is specified (see 5.1), this level of protection should be reserved for the acquisition of (name of commodities) for resupply worldwide under known favorable handling, transportation, and storage conditions."

5.3.6.11 Environmental pollution preventive measures. Specifications covering materials that could breakdown into environmentally harmful elements shall include disposability criteria. A paragraph similar to the following shall be included:

"6._._ Disposability. One or more of the following methods shall be used to accomplish disposal of (list material): reuse, recycling, baling, sanitary landfill, composting, incineration, pyrolysis, or sea disposal."

5.3.6.12 Government-furnished and Government-loaned property. When Government-furnished or Government-loaned property is listed in the specification, the following paragraphs shall be included in section 6:

"6._._ Government-furnished property. The contracting officer should arrange to furnish the property listed in 3._._.

6._._ Government-loaned property. The contracting officer should arrange to loan the property listed in 3._._."

5.3.6.13 Material Safety Data Sheets (see 4.2.2). When the specification describes products containing hazardous materials, the following shall be included in section 6:

"6._._ Material Safety Data Sheets. Contracting officers will identify those activities requiring copies of completed Material Safety Data Sheets prepared in accordance with FED-STD-313. The pertinent Government mailing addresses for submission of data are listed in FED-STD-313."

5.3.6.14 Patent notice. When a specification is prepared to cover a patented item, the specification shall list the patents involved and include the following paragraph.

"6._._ Patent notice. The Government has a royalty-free license under the following listed patents for the benefit of manufacturers of the item either for the Government or for use in equipment to be delivered to the Government.

US patent number"

If royalty-free licenses cannot be obtained, the specification shall list the patents together with their expiration date and the statement that the Government does not have a royalty-free license.

5.3.6.15 Part or Identifying Number (PIN). When a specification requires a PIN, section 6 shall include a paragraph entitled "Part or Identifying Number" that will either describe how the PIN is constructed or reference the appropriate associated document or appendix that describes the PIN construction.

5.3.6.16 Subject term (key word) listing. The specification shall contain a listing of subject terms (key words) that allows for identification of the document during retrieval searches. Subject terms may be descriptors, keywords, posting terms, identifiers, open-ended terms, subject headings, acronyms, code words, or any words or phrases that identify the principal subjects, and that conform to standard terminology and are exact enough to be used as subject index entries. The subject terms shall not repeat words from the title of the document. The subject terms are to be listed alphabetically

in a single column with the main noun or word first, followed by sequential modifiers separated by commas. Word groups considered to be proper or recognized nouns such as "military specification" should not be separated. The number of subject terms listed shall not exceed 25.

5.3.6.17 International standardization agreements. The preparing activity is responsible for implementation of international standardization agreements as they relate to its responsibilities. When specifications reference international standardization agreements as part of their requirements, the following statement shall be included:

> "Certain provisions of this specification (identified by paragraph number or similar manner, if appropriate) are the subject of international standardization agreement (insert appropriate document reference). When amendment, revision, or cancellation of this specification is proposed that will modify the international agreement concerned, the preparing activity will take appropriate action through international standardization channels, including departmental standardization offices, to change the agreement or make other appropriate accommodations."

5.3.6.18 Identification of changes from previous issue. Revisions of specifications shall include asterisks or vertical lines at the left margins of the pages to indicate where changes have been made with respect to the previous issue. The following note shall be included in section 6 of the specification:

> "6._._ Changes from previous issue. The margins of this specification are marked with asterisks (or vertical lines) 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."

If the changes are extensive and too numerous to annotate, the following note shall be included in section 6 of the specification.

> "6._._ Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes."

5.4 CONCLUDING MATERIAL

5.4.1 Concluding material. The following concluding material shall be provided at the end of the document following any tables, figures, appendixes, or indexes, and before the DD Form 1426.

a. Preparing activity.

b. Custodians (applies to coordinated specifications).

c. Review and user activities (applies to single department or fully coordinated specifications).

d. Civil agency coordinating activities.

e. Agent, if assigned.

f. Project number (required for all standardization documents, except for supplements and validation notices).

5.4.1.1 Activity symbols. The symbols used to identify the preparing activity, custodians, reviewer, and user activities, and other interested activities shall be in accordance with the current issue of SD-1. This information and the project number assigned by the lead standardization activity shall be listed as shown in the following example:

"Custodians:
Army - AR
Navy - OS
Air Force - 16

Review activities:
Army - AT, CR, ME
Navy - EC, SH, YD
Air Force - 11, 26, 85
DLA - GS

User activities:
Army - MR
Navy - CG, MC
Air Force - 90

Civil agency coordinating activities: (where appropriate)
AGR - APS
HHS - FEC

Preparing activity:
Navy - OS

Agent:
DLA - GS

(Project MISC-0014)"

The preparing activity shall select and list potential review and user activities during specification development, from interest as registered in the FSC DODISS and its cumulative bimonthly supplements, the participating activity contacts, cataloging data, project history files, and other sources. The preparing activity shall confirm the selected level of interest with these activities during coordination. A preparing activity or custodian shall not be listed as a review or user activity. A review activity shall not be additionally listed as a user activity. If a military department has no interested activity, the department shall be omitted from its sequential order of listing. The listing of review and user activities shall be in alphabetical or numerical order, as applicable.

5.4.1.2 Standardization Document Improvement Proposal (DD Form 1426). Preparing activities shall include this form as the last sheet of all specifications in six-section format. It shall not be included on specification sheets, amendments, supplements, and notices. It shall be self-addressed and the document identifier block shall be completed by the preparing activity. The preparing activity shall arrange for and enter the postage permit number and "paid by" information in the appropriate location on the DD Form 1426. This form is not required on classified specifications; however, if used, security regulations shall apply (see 4.8). (For an example, see the DD Form 1426 at the end of this standard.)

5.5 APPENDIXES

5.5.1 General. When required, one or more appendixes as set forth in this section, shall be included as an integral part of a specification. A table of contents and cover for the appendix shall not be used.

5.5.2 Purpose. The appendix contains supplementary information at the end of the specification and bound integrally with it (see figure 9). An appendix is used only to specify the details of usage or related processes involving the materials or products which are subject to the general specification, and submittal plans for products requiring qualification. When such additional provisions are applicable to or expected to apply to three or more specifications, these provisions shall be included in a separate document.

5.5.3 Submittal plans. Product submittal plans may be included as an appendix of the applicable specification, when required, to stipulate the number and types of items to be submitted for qualification approval:

a. When varying numbers of samples must be submitted for compliance with grouped test requirements; or

b. When qualification testing is performed in various phases such as life tests, nondestructive tests, or humidity tests.

These criteria are particularly applicable to items that are available in such a variety of sizes and capacities for each style of item as to require selective sampling from the range of sizes and capacities in order to furnish a statistically significant sample. This will assure an adequate selection without resorting to exhaustive tests of all available items and thus offer a reasonable basis for approval of the entire range of items.

5.5.4 Numbering and titling. The appendix shall begin on the next page following the specification. The upper center of each page shall be marked with the specification identifier and the word "APPENDIX" two lines below the identifier. When it is essential to include more than one appendix, identification shall be alphabetical (A, B, etc.). The title shall be located two lines below the word "APPENDIX" on the beginning page only. Sections shall be numbered using decimals and shall be numbered in multiples of ten. The first section (Scope) shall be 10 with sub-sections 10.1, 10.1.1, etc.; the second section (Applicable documents) shall be 20; the third 30, etc. Number pages consecutively following the last page of the specification.

5.5.5 Paragraph headings. Paragraph headings beginning with the third section of an appendix need not duplicate the structure of the specification of which the appendix is a part.

5.5.6 Scope. An appendix shall have a statement of scope to indicate the coverage and limitations of the appendix to ensure its proper application and use. The following shall be included: "This Appendix (is or is not) a mandatory part of the specification. The information contained herein is intended for (compliance or guidance only)".

5.5.7 References. References which may be required and which relate only to the appendix shall be listed in the appendix under the heading "20. APPLICABLE DOCUMENTS" and shall not be referenced in section 2 of the specification. The references shall be listed as specified for section 2 (see 5.3.2) under the following headings:

20. APPLICABLE DOCUMENTS.
20.1 Government documents.
20.1.1 Specifications, standards, and handbooks.
20.1.2 Other Government documents, drawings, and publications.
20.2 Non-Government publications.

If section 20 is not applicable, indicate as shown below.

"20. APPLICABLE DOCUMENTS. This section is not applicable to this appendix."

5.6 INDEX

5.6.1 Purpose. An alphabetical index may be placed at the end of a specification to permit ready reference to contents. Its use shall be limited to lengthy specifications. If used, an index follows the basic specification and any appendix. The pages are numbered continuously following the last page of the basic specification or appendix, as applicable. The document identifier shall appear in the upper center of each page.

5.7 REVISIONS

5.7.1 Specification revision. A revision shall be prepared and processed in the same manner as a new document (see 6.3). At the time of revising, the entire contents of the specification shall be analyzed, and brought up-to-date and into compliance with the requirements of this standard. Revisions can also include inactivation for new design (see 5.2.4.1).

5.7.2 Format. Revisions shall be prepared in the format of a new specification. All paragraphs, figures, tables, and pages shall be renumbered, as necessary, to eliminate all number suffixes and deletions and to establish correct sequence of requirements that were added by amendment.

5.7.3 Notation of revisions. When specifications are revised, and if the changes are not too extensive, asterisks or vertical lines shall be placed at the margin of the page to indicate where changes (additions, modifications, corrections, deletions) have been made with respect to the previous issue. See 5.3.6.18 for note to be included in section 6 of the specification explaining the use or absence of the asterisk or vertical line.

5.7.3.1 Summary sheet for proposed coordinated specification. A summary sheet shall be prepared for a proposed coordinated specification indicating the significant additions, deletions, corrections, or modifications. When practicable, supporting background information concerning the changes shall be included. The summary sheet shall accompany the proposed draft when it is circulated for coordination.

5.7.4 Revision indicators. Revisions of military specifications shall be indicated by a capital letter following the number and preceding any suffix. Example: MIL-C-17A. The first revision shall be marked with the letter "A" and succeeding revisions shall be indicated by the other letters in alphabetical sequence, except that the letters I, O, Q, S, and Z shall not be used. When a coordinated specification supersedes a limited coordination specification retaining the same number, the first issue of the coordinated specification shall be considered a revision of the limited coordination specification, thus taking the next appropriate letter.

Example: The first coordinated revision superseding MIL-H-865(SH) would be identified as MIL-H-865A.

If the coordinated revision supersedes a "USED IN LIEU OF" specification of the same number, the two zeros in front of the number and activity symbol following the number shall be dropped and the next appropriate capital letter shall be added.

Example: MIL-T-005237A(GL) when superseded shall appear as MIL-T-5237B.

5.7.5 PIN revisions. Specification revisions that modify the requirements for items covered to the extent that they are not both physically and functionally interchangeable with those covered by the specification being superseded, shall assign new PIN's to the items. A cross-reference of new PIN's which are substitutable for the preceding part numbers shall be included in the specification. Each generation of substitution data will be retained in the specification for traceability. Revisions which do not affect the interchangeability characteristics of the items covered shall retain the existing part numbers, but the part numbers shall be designated as PIN's (see 4.4).

5.8 SUPPLEMENTS

5.8.1 General. A supplement to a military specification shall be a separately issued document, associated with the applicable specification (see figure 10) and shall be issued only when the number of associated documents exceeds five in number, in lieu of listing in section 2 of the basic document (see 5.3.2.1.1).

5.8.2 Contents. A supplement shall be prepared to list associated detail specifications, specification sheets, and sheet form standards (see 6.3).

5.8.3 Format. Supplements shall carry the same headings, titles, symbols, specification number, and revision, as the general specifications with which they are associated. The word "SUPPLEMENT" followed by the numeral "1" and date of issue shall also be included beneath the document identifier. Supplement revisions shall be marked with a capital revision letter in alphabetical sequence to identify successive issues of the supplement. For example, "SUPPLEMENT 1A" would supersede "SUPPLEMENT 1." Each time the basic specification is revised, the supplement is revised and reverts to "Supplement 1".

5.8.4 Preamble. The following preamble shall be on supplements under the title: "This supplement forms a part of MIL-D-000, dated _____."

5.8.5 Captions for supplements. Captions, such as "SPECIFICATION SHEETS," "ASSOCIATED DETAIL SPECIFICATIONS," and "MS STANDARDS," shall head each group of associated documents listed on the supplement.

5.8.6 Concluding material. Supplements shall show the preparing activity symbol, FSC designation, and agent, if applicable. The custodian, review activity, and user symbols may be omitted (see figure 10).

5.8.7 Page numbering and document identification of supplements. The first page shall indicate the total number of pages in the supplement and the page number (for example, 1 of 6) at the bottom center of the page and shall have the document identifier and date in the upper right corner of the page. Page 2 and all succeeding pages shall be successively numbered with Arabic numerals at the bottom center of the page. The document identifier shall be placed on the second and succeeding pages in the upper center of the page. The word "SUPPLEMENT" and number shall be placed below the document identifier (for example, SUPPLEMENT 1, 1A, 1B, etc.).

5.8.8 FSC, GP, or area designation. The FSC, GP, or area designation shall be the same as for the basic specification, and shall be shown in the lower right hand corner of the first page.

5.8.9 Distribution statement. The appropriate distribution statement shall be placed on the first page on the line immediately below the FSC, GP, or area designation as shown on figure 10.

5.9 AMENDMENTS

5.9.1 Purpose. An amendment shall be prepared to make brief or minor changes and to correct errors (see 6.3 and figures 11 and 12). Lengthy changes to specifications shall be accomplished as revisions (see 5.7). When the number of pages in the amendment exceeds 25 percent of the pages of the document, or when the security classification is changed, the document shall be revised.

5.9.2 Document identifiers for amendments to military specifications. The document identifier of the amendment shall be the same as the specification with which it is associated. The word "AMENDMENT" followed by a sequentially assigned arabic serial number, and the date of approval shall appear under the document identifier. Amendments shall be numbered consecutively for each specification. Amendment numbers, including those for interim amendments, will be assigned by the preparing activity for the specification. A line shall be placed between the approval date and the supersession data shown. Identification of military specification amendments shall be in the following formats:

a. Amendment to coordinated military specification:

MIL-C-39029/79 AMENDMENT 1 10 March 1980	or	MIL-C-54224C AMENDMENT 2 15 April 1980 SUPERSEDING AMENDMENT 1 8 February 1971

b. Amendment to limited coordination military specification:

MIL-R-6106/7B(USAF)
AMENDMENT 2
1 May 1980
SUPERSEDING
AMENDMENT 1
12 June 1979

c. Interim amendment to coordinated military specification. (The symbol of the authorizing activity shall be placed immediately following the amendment number.):

MIL-S-19500/241D
INT. AMENDMENT 1(USAF)
20 November 1973

d. Interim amendment superseding an interim amendment:

MIL-S-19500/158F
INT. AMENDMENT 4 (USAF)
15 May 1978
SUPERSEDING
INT. AMENDMENT 3 (USAF)
22 March 1977
USED IN LIEU OF
AMENDMENT 2
11 October 1973

5.9.3 Amendment headings and titles. The headings and titles for military specification amendments shall be the same as the specifications with which they are associated.

Example: MILITARY SPECIFICATION

JACKS, TELEPHONE,
GENERAL SPECIFICATION FOR

5.9.4 Preambles. All amendments to military specifications shall have a preamble. One of the following preambles shall be used.

5.9.4.1 Amendments to coordinated military specifications:

"This amendment forms a part of _____, dated _____, and is approved for use by all Departments and Agencies of the Department of Defense."

5.9.4.2 Amendments to limited coordination military specifications:

"This amendment forms a part of _____, dated _____, and is approved for use by the (preparing activity), Department of the (_____) and is available for use by all Departments and Agencies of the Department of Defense."

"This amendment forms a part of_____, dated _____, and is approved for use by the Department of the ( ) and is available for use by all Departments and Agencies of the Department of Defense."

5.9.4.3 Interim amendments to coordinated military specifications:

"This interim amendment is approved for use within (Military Department or Activity), with MIL-D-0000 (dated)_____."

5.9.4.4 Amendment to limited coordination military specifications with restricted distribution:

> "This amendment forms a part of _____, dated _____, and is approved for use by the (preparing activity), Department of the (_____) and is available for use within the distribution limitations noted below."

5.9.5 FSC, GP, or area designation. The FSC, GP, or area designation shall be the same as for the basic specification and shall be shown in the lower right hand corner of the first page.

5.9.6 Distribution statement. The appropriate distribution statement shall be placed on the first page on the line immediately below the FSC, GP, or area designation as shown on figures 11 and 12.

5.9.7 Arrangement of text.

5.9.7.1 Replacement page method. Insertable replacement pages may form a portion of the amendment to a military specification in addition to (or in place of) the sequential listing of individual corrections. Page 1 of a specification shall not be amended by a replacement page. Changes to page one shall only be accomplished as specified in 5.9.7.2 or by complete revision to the specification. In using the insertable replacement page method, both the page being changed and the applicable back-up page must be replaced so that the old page can be removed and the new page inserted. Back-up pages requiring corrections will be treated the same as an insertable replacement page and changes annotated in accordance with 5.9.15. All pages, including pages reprinted without change as back-up pages, shall bear the notation "AMENDMENT (amendment number)" beneath the document identifier at the top of the page. A note "Supersedes page (number) of (either the basic specification or the previous amendment, as applicable) of (date)" shall be placed in the lower left-hand corner of each revised page. Pages reprinted without change shall be marked "Reprinted without change" in the lower left-hand corner. The insertable replacement pages shall be appended to the amendment and shall bear the page numbers of the pages being replaced. The first page of the amendment shall carry a listing of the insertable replacement pages under the following heading (see figure 11):

> "The attached insertable replacement pages listed below are replacements for stipulated pages. When the new pages have been entered in the document, insert the amendment as the cover sheet to the specification."

5.9.7.2 Text substitution method. Each individual correction shall be presented separately and the particular page, paragraph, line, table, or figure in which it occurs shall be identified. The page number identifying location of changes shall be centered on the page. The word "PAGE" shall be capitalized and followed by the number. Each page number shall appear only once and shall

not be underlined. If changes continue onto another page of the amendment, the successive pages shall be typed as a continuous document. The word "PAGE" and number shall not be repeated on the following page of the amendment.

5.9.8 Verb forms. The imperative form of the verb shall be used in the amendment for indicating the changes to be made in the specification. For example: Delete "2.50" and substitute "2.00".

5.9.9 Deletion of paragraphs. When paragraphs of the specification are deleted by the amendment, the remaining paragraphs shall not be renumbered.

5.9.10 Insertion of paragraphs, figures, and tables. When new paragraphs, figures, or tables are added to the specification, they should be numbered in such a way that renumbering of existing paragraphs, figures, and tables is not necessary.

Example:	Existing	Added	Existing
	Table II	Table II-1	Table III
	Figure 2	Figure 2A	Figure 3
	Paragraph 5.11	Paragraph 5.11.1	Paragraph 5.12

5.9.11 Successive (cumulative) amendments. Amendments are cumulative and each successive amendment shall be written to completely supersede the previous amendment.

5.9.12 Successive interim amendments. Except for those requirements that are being changed, each successive interim amendment shall consolidate information contained in the previous interim amendment.

5.9.13 Page numbering. The first page shall indicate the total number of pages in the amendment and the page number (such as, 1 of 3 or 1 of 1) at the bottom center of page. All remaining pages of multipage amendments shall be successively numbered with arabic numerals at the bottom center of page. Insertable replacement pages shall carry the page number of the page being replaced and, for the purpose of page count only, shall not be counted as part of the amendment.

5.9.14 Concluding material. The concluding material of the specification shall be shown after the text of the amendment in the same manner as in the basic specification, including the project number for the amendment action. For interim amendments, the preparing activity; review and user activities, if any, of the limited coordination department; and project number shall be listed.

5.9.15 Changes from the previous amendment. Asterisks or vertical lines shall be placed in the left margin opposite the changes to denote changes from the previous amendment (on figures, the asterisk shall be placed as near the actual change as possible, so that it can be readily identified). The following note shall be added at the end of the amendment preceding the concluding material:

> "The margins of this amendment are marked with an asterisk or vertical lines to indicate where changes (additions, modifications, corrections, deletions) from the previous amendment 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 amendment."

5.10 NOTICES

5.10.1 Purpose. Notices are used to inactivate for new design, cancel, reinstate, or validate specifications. Notices shall not be used to transmit revisions or amendments. Notices completely supersede all previous notices.

5.10.2 Validation notice. A validation notice shall be prepared to indicate that a document is technically valid without changes (see 6.3). A validation notice shall be issued without a project number and without formal coordination. A notice is required at the time of the five year overage review if the document is determined to be valid, and may be issued at other times if the preparing activity determines it to be necessary or beneficial. The format of the notice shall be similar to that shown on figure 13, or figure 14 for validation of inactive for new design documents. The actual wording may vary to indicate the reason for the notice, however, it shall include a definite statement that the document as approved is still valid for acquisition without change.

5.10.3 Inactive for new design notice. An inactive for new design notice shall be prepared to indicate that an item or process is prohibited for use in new design and is used only in existing assemblies or units (see 6.3). Items or processes so designated may only be used for new assemblies or units developed for existing design contracts where the inactive item or process is being used for existing designs in the same contract, or in assemblies for existing units or systems required under future contracts. Superseding documents for new design application shall be referenced in the notice when applicable and shall have a different specification number than that of the specification covered by the notice. When applicable, a precautionary note shall be included as follows: "CAUTION: The supersession information is valid as of the date of this notice and may be superseded by subsequent revisions of the superseding document." When a QPL is associated with the "inactive for new design" specification, the following sentence shall be included in the notice: "The Qualified Products List (QPL) associated with this inactive for new design specification will be maintained until acquisition of the product is no longer required whereupon the specification and QPL will be canceled" (see figure 15). Inactive status can also be accomplished in a revision (see 5.2.4.1).

5.10.4 Cancellation notice. A cancellation notice shall be prepared when a military specification or specification sheet is no longer required (see 6.3 and figures 16 and 17). The preparing activity (or the lead standardization activity in the case of overage documents) will issue a notice of cancellation, coordinating with the custodians, review, and user activities giving the reason for cancellation, and the superseding document, if any.

5.10.5 Reinstatement notice. A reinstatement notice shall be prepared to reinstate a canceled specification (see 6.3). The preparing activity, or with its permission, another activity, may reinstate a canceled specification by a notice of reinstatement (see figure 18). The notice of reinstatement, with a sequentially assigned Arabic number, shall supersede the previous notice of cancellation. If the specification is coordinated, only the custodians and interested activities that have approved the reinstatement shall be shown on the reinstatement notice. If the coordinated document is reinstated for use by a single activity, the activity symbol shall be shown after the specification number, and this information shall also be reflected in the text. The text for the reinstatement notice shall be as shown on figure 18. Reinstatement notices submitted to Naval Publications and Forms Center for printing and distribution will be accompanied by a copy of the reinstated specification and if applicable, the amended or revised specification. Both shall be suitable for photo-offset reproduction. Reinstated documents shall be distributed as attachments to the reinstatement notice, and shall include a new DD Form 1426 (see 5.4.1.2).

5.10.6 Document identifier. The document identifier of a notice shall be typed in the upper right corner of the first page. The following elements shall be included in alignment with the first letters (block form):

a. The document identifier of the specification (associated specification or specification sheet) being inactivated, canceled, reinstated, or validated. The identification of interim military or military "USED IN LIEU OF" specifications includes the activity code designation of the preparing activity.

b. The word "NOTICE" followed by a sequentially assigned Arabic number shall be placed below the specification number on inactivations, cancellations, reinstatements, and validations.

c. The date of approval.

Example of sequential actions:

1. Inactive for new design notice:

   MIL-G-82143(MC)
   NOTICE 1
   18 October 1972

2. Cancellation notice:

   MIL-G-82143(MC)
   NOTICE 2
   16 February 1973
   SUPERSEDING
   NOTICE 1
   18 October 1972

3. Reinstatement notice:

MIL-G-82143(MC)
NOTICE 3
15 April 1976
SUPERSEDING
NOTICE 2
16 February 1973

4. Validation notice:

MIL-G-82143(MC)
NOTICE 4
13 May 1986
SUPERSEDING
NOTICE 3
15 April 1976

5.10.7 Heading and title. A notice shall carry the same heading and title as the specification. The notice of cancellation, inactivation, reinstatement, or validation shall be enclosed in a box in the upper left-hand corner of the first page (see figures 13 through 18).

5.10.8 Preamble. A preamble shall not be included.

5.10.9 FSC, GP, or area designation. The FSC, GP, or area designation shall be the same as for the basic specification and shall be shown in the lower right hand corner of the first page.

5.10.10 Distribution statement. The appropriate distribution statement shall be placed on the first page on the line immediately below the FSC, GP, or area designation as shown on figures 13 through 18.

5.10.11 Concluding material. The concluding material for all notices shall be in accordance with 5.4.1, except as follows:

a. Validation notices shall not require project numbers.

b. Custodians, review and user activities, and civil agency coordinating activities shall not be listed for inactive for new design and cancellation notices.

5.11 SPECIFICATION SHEETS

5.11.1 Purpose. A specification sheet is a document associated with a general specification (see 3.10), covering the unique technical requirements, tests, and packaging requirements for a single style, type, class, grade, or model of an item (or series of items which vary only with respect to parameters such as value, size, tolerance, material, finish, failure rate) which are best presented in graphic or tabular form.

5.11.2 Coverage. Specification sheets shall be prepared to describe the characteristics and performance requirements usually needed by designers and engineers for application of the items in assemblies, and for their acquisition (see 6.3). The specification sheet shall be prepared on 8-1/2 by 11 inch plain, white paper (see figure 19) or on a DD Form 672 (see figure 20), as applicable.

5.11.3 Limitations. Specification sheets shall not be prepared unless it is known that a family of items differing in style, type, class, grade, model, or similar variables will need individual coverage. Any single specification sheet together with its associated general specification, forms a complete acquisition specification for the item(s) covered. Specification sheets supplement the referenced general specification. Therefore, requirements in the general specification shall not be duplicated in specification sheets. All requirements cited in the general specification are applicable to the associated documents unless otherwise indicated (for example, shock N/A) on the associated document (specification sheet, associated detail specification, or MS sheet).

5.11.4 Document identifier. The specification sheet is identified in the same manner as an associated detail specification (see 5.2.3.1.1). The specification sheet number shall be assigned by the preparing activity for the general specification which shall also assign numbers for associated limited coordination specification sheets. The document identifier shall be placed in accordance with 4.14, except when a DD Form 672 is used.

5.11.5 Date and supersession data. For date and supersession data, see 5.2.3.1.2 and 5.2.4, respectively. When a DD Form 672 is used, the date shall be entered in the appropriate block (see figure 20).

5.11.6 FSC, GP, or area designation. For the FSC, GP, or area designation requirement, see 5.2.7. When a DD Form 672 is used, the FSC, GP, or area designation shall be entered in the appropriate block (see figure 20).

5.11.6.1 Distribution statement. The appropriate distribution statement shall be placed on the first page as shown on figures 19 and 20, as applicable.

5.11.7 Page number. The first page only shall indicate the page number and total number of pages in the specification sheet at the bottom center of the page. Example: 1 of 7. The successive pages shall contain the page number only (2, 3, 4, etc.), at the bottom center of the page. When a DD Form 672 is used, the page number shall be entered in the appropriate block (see figure 20).

5.11.8 Heading. Each military specification sheet shall have the heading "MILITARY SPECIFICATION SHEET" two lines above the title (see figure 19), except when a DD Form 672 is used.

5.11.8.1 Title. Where specification sheets are for similar items with minor differences from one item to another, the specification sheet titles shall be the same as that of the general specification (excluding the words "GENERAL SPECIFICATION FOR") with an identification of the style, type, class, grade, or model covered, as appropriate. If it is determined that a specification sheet shall be prepared for components of an assembly that have different basic noun names than the general specification, the specification sheet titles shall reflect the basic noun name of the specific item associated with the general specification. In all cases, the title shall be determined in accordance with 5.2.2.

5.11.9 Preamble. For preamble requirements, see 5.2.5.

5.11.10 Acquisition note. The acquisition note is preprinted on DD Form 672 and the appropriate general specification number shall be entered. When other than DD Form 672 is used, the following note shall be included below the preamble in both coordinated and limited coordination specification sheets (see figures 19 and 20).

> "The requirements for acquiring the product described herein shall consist of this specification sheet and the issue of the following specification listed in that issue of the Department of Defense Index of Specifications and Standards (DODISS) specified in the solicitation: (document identifier of general specification)"

5.11.11 Content. The specification sheet shall consist of dimensional data, and if applicable, requirements, tests, and examinations not covered in the general specification. The text shall, in most instances, cover a number of items differing only in one or two characteristics, such as length, diameter, resistance, capacitance, ohmic value, etc. Only one style, type, or model of an item (process) shall be covered by a specification sheet . The specification sheet shall contain the description, substitutability data, design features, characteristics, and performance data, as applicable. Presentation shall be in the form of figures, tables, and text. The figure shall normally be placed at the top of the first page and shall be numbered and titled. Figure 19 represents the specification sheet format as applied to the area of electronic parts, but not necessarily the specific content. Requirements cited on a specification sheet should appear in the same sequence shown

shown on the general specification. Requirements in the general specification that are not applicable to the specification sheet shall be noted (for example, shock N/A).

5.11.12 PIN. The PIN shall be included in the specification sheet (see 4.4). NATO Item Identification Number (NIIN), Federal Item Identification Number (FIIN), and National Stock Number (NSN) shall not be included. There are two types of PIN's used: nonsignificant PIN and significant PIN.

a. Example of a nonsignificant PIN:

"PIN: M12345/2-(applicable dash number from table I).

TABLE I. Dash number and operating characteristics.

Dash no.	Fig.	Actuating flow increasing gal/min max	Deactuating flow decreasing gal/min minimum	Maximum allowable pressure drop	Fluid media
01	1	0.45	0.3	4 lb_f/in^2 at 0.3 gal/min	I
02	2	0.85	0.5	6 lb_f/in^2 at 0.7 gal/min	I
03	3	0.55	0.45	5 lb_f/in^2 at 0.5 gal/min	II
04	4	3.10	2.7	5 lb_f/in^2 at 3.0 gal/min	II

The nonsignificant number M12345/2-02 would be the item shown on figure 2, actuating flow increasing gal/min maximum 0.85, deactuating flow decreasing gal/min minimum 0.5, maximum allowable pressure drop 6 lb_f/in^2 at 0.7 gal/min, and fluid media I."

b. Example of a significant (coded) PIN (second type):

"PIN: Consists of the letter M, the basic number of the specification sheet, and a dash number compiled from the code.

Specification sheet number	Dash number				
M12345/1-	A	1	0	L	1A
	Insert	Shield and shield clamp location or retaining plate	Shell type	Jackscrews or guidepins	Contacts

PIN CODE:

Insert	Shield and Shield clamp location or retaining plate	Shell type
A - MS18264	Shield	0 - None included
B - MS18240	1 - Top MS24132	
C - MS18242	2 - Side MS24132	
D - MS18244	3 - Top MS24133	
E - MS18246	4 - Side MS24133	
F - MS19258	5 - Top MS18193	
G - MS18250	6 - Side MS18193	
H - MS18252	0 - None included	
J - MS18254		

Jackscrews or guidepins		Contacts: Per MIL-C-12345
L - Long jackscrews	MS18194	1A - 100 percent size 16-16
S - Short jackscrews	MS18195	2A - 100 percent size 16-20"
G - Guidepins	MS18197	
0 - None included		

5.11.13 Revision. A revision to a specification sheet shall be prepared in accordance with 5.7, except for the notation of revision.

5.11.13.1 Notation of revision. Changes shall be annotated by the current revision letter within a circle and placed next to each change. On page(s) where the actual change(s) occurs, the revision letter shall appear in the body in appropriate relationship to the change. At the bottom of the first page shall be the notation (for the "A" revision): "Ⓐ denotes changes." These revision letters shall be deleted by subsequent revision. If the changes are extensive, the revision letters and note shall not be used. In this event, the following note shall be added at the end of the specification sheet and preceding concluding material: "Revision letters are not used to denote changes due to the extensiveness of the changes." Revisions shall be prepared when specification sheets are four pages or less, when specification sheets are prepared on the DD Form 672, or when it is necessary to change the security classification. Specification sheets (except for those using DD Form 672 format) exceeding four pages may be amended, provided the amendment does not exceed two pages.

5.11.13.2 Revision of existing MS sheet form standards. Existing MS Sheet Form Standards, as they are revised, shall be reformatted on the DD Form 672 Military Specification Sheet (see figure 20), or manuscript form (see 4.22). The existing MS number may be retained; however, it is preferred that existing MS numbers be converted to military specification sheet numbers (see 5.2.3.1.1) if the renumbering does not adversely affect existing systems. If MS numbers are converted to military specification sheet numbers, then substitution data shall be included to supersede every MS dash number.

5.11.14 New MS sheets. New military specification sheets with the MS prefix shall not be prepared for any new military specifications. MS specification sheets (formerly known as MS Sheet Form Standards) using the MS numbering system may continue to be used only with a federal or military specification where a series of MS numbered documents already exists.

6. NOTES

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

6.1 Intended use. Specifications conforming to the requirements of this standard are intended for use as military standardization documents and are listed in the DODISS. The general format described should also be considered for use in developing purchase descriptions and other non-DODISS procurement specifications, especially those which may be converted to a military specification at a later date.

6.2 Issue of DODISS. When this standard is used in acquisition, the applicable issue of the DODISS must be cited in the solicitation (see 2.1.1 and 2.2).

6.3 Data requirements. The following Data Item Descriptions (DID's) must be listed, as applicable, on the Contract Data Requirements List (DD Form 1423) when this standard is applied on a contract in order to obtain the data, except where DOD FAR Supplement 27.475-1 exempts the requirement for a DD Form 1423.

Reference Para.	DID Number	DID Title	Suggested Tailoring
4.2, 5.7.1	DI-SDMP-80001	Military specification	---
5.8.2	DI-SDMP-80578	Supplement to military specification	---
5.9.1	DI-SDMP-80579	Amendment to military specification	---
5.10.2	DI-SDMP-80580	Validation notice	---
5.10.3	DI-SDMP-80581	Inactive for new design notice	---
5.10.4	DI-SDMP-80582	Cancellation notice	---
5.10.5	DI-SDMP-80583	Reinstatement notice	---
5.11.2	DI-SDMP-80584	Military specification sheet	---

The above DID's were those cleared as of the date of this standard. The current issue of DOD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL), must be researched to ensure that only current, cleared DID's are cited on the DD Form 1423.

6.4 Tailoring guidance. To ensure proper application of this standard, invitations for bids, requests for proposals, and contractual statements of work should tailor the requirements in sections 4 and 5 of this standard to exclude any unnecessary requirements. For example, if the statement of work requires a revision to a stand alone specification, then all the paragraphs in this standard related to amendments, notices, supplements, and specification sheets should be excluded.

6.5 Subject term (key word) listing.

Amendments
Cancellation notices
Data item descriptions
Distribution statement
Metric
MS sheets
Notices
Purchase descriptions
Reinstatement notices
Revisions
Specification sheets
Standardization documents
Supplements
Tailoring of requirements
Validation notices

6.6 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

CHECKLIST FOR DRAFTING MILITARY SPECIFICATIONS

The following checklist may be used in drafting military specifications. It is not all inclusive and must be used with caution only as a guide, not as a replacement for instructions in this standard. The subjects in the list must be considered in the development of the specification, but should be used only where required. The actual content of a specification depends upon the item covered by the specification and format requirements.

1. Security classification
2. Document identifier (new, revision, amendment, and notice)
3. Initial draft note
4. Heading
5. Title
6. Supersession data
7. Preamble
8. Beneficial comments
9. FSC, group, or area designation
10. AMSC number or AMSC N/A
11. Distribution statement

SECTION 1: SCOPE
1. Scope
2. Classification, if applicable

SECTION 2: APPLICABLE DOCUMENTS
1. Government-furnished documents,
2. Proper sequence of listings
3. Titles and symbols same as on documents
4. Other publications
5. Documents referenced in sections 3, 4, and 5 only
6. Order of precedence
7. Source of documents

SECTION 3: REQUIREMENTS
1. Paragraph on associated detail specifications, MS sheets, or specification sheets
2. Organization and sequencing of requirements and tests
3. Qualification clause
4. Reliability
5. Standard sample (if applicable)
6. First article
7. Materials (including statement on toxic products and formulations and marking)
8. Environmental considerations
9. Recycled, reclaimed, recovered material
10. Design
11. Construction
12. Hardware
13. Maintainability
14. Transportability
15. Performance characteristics
16. Energy efficiency
17. Human factors
18. Safety
19. Environmental requirements
20. Hardness requirements
21. Details of units or parts
22. Chemical and physical properties
23. Electromagnetic interference suppression
24. Dimensions
25. Weight
26. Color
27. Finish
28. Identification plate or PIN markings
29. Anti-counterfeiting
30. Government-furnished property
31. Government-loaned property
32. Workmanship
33. All requirements covered by tests

FIGURE 1. Checklist for drafting military specifications.

SECTION 4: QUALITY ASSURANCE PROVISIONS

1. Arrangement and sequencing
2. Responsibility for inspection and responsibility for compliance
3. Classification of inspection
4. Toxicological product formulations
5. Inspection conditions
6. First article inspection
7. Qualification inspection
8. Retention of qualification
9. Quality conformance inspections
10. Noncompliance
11. Inspection of packaging
12. Classification of defects
13. Test methods for requirements in section 3

SECTION 5: PACKAGING

1. Packaging level (levels A, B, C, or commercial, as applicable)
2. Preservation level (levels A, B, C, or commercial, as applicable)
3. Packing level (levels A, B, C, or commercial, as applicable)
4. Marking (includes labeling for packaging containers)
5. Commodities covered by packaging specifications

SECTION 6. NOTES

1. Parenthetical note
2. Intended use
3. Acquisition requirements
4. Data requirements
5. First article
6. Standard sample information
7. Qualification
8. Definitions
9. Supersession data and substitutability data
10. Cross-reference of classification
11. Level B preservation
12. Environmental pollution preventive measures
13. Government-furnished and loaned property
14. Material safety data sheets
15. Patent notice
16. Part or Identifying Number
17. Subject term (key word) listing
18. International Standardization agreements
19. Identification of changes

APPENDIX(ES)

INDEX

CONCLUDING MATERIAL

1. Preparing activity, custodians, and review and user activities and agent if appropriate
2. Project number
3. DD Form 1426, Standardization Document Improvement Proposal

FIGURE 1. Checklist for drafting military specifications - Continued.

The following is a list of standard (boilerplate) paragraphs which are either required in military specifications or are required when applicable. Except for those items marked with an asterisk, there shall be no deviation from the wording shown in the referenced paragraph. For those paragraphs marked with an asterisk, the referenced paragraph provides only an example of acceptable wording. The precise words will vary depending upon the situation.

ALWAYS REQUIRED

Preamble (see 5.2.5)
Beneficial comments (see 5.2.6)
*Distribution statement (see 5.2.9)
Responsibility for inspection (see 5.3.4.2)
Responsibility for compliance (see 5.3.4.2)
*Subject term (key word) listing (see 5.3.6.16)

REQUIRED WHEN APPLICABLE

Draft note (see 5.2)
Government documents (see 5.3.2.1.1)
Non-Government documents (see 5.3.2.1.2)
Order of precedence (see 5.3.2.1.3)
Specification sheets (see 5.3.3.1a)
Qualification requirement (see 5.3.3.2)
*First article requirement (see 5.3.3.3)
Toxicity (see 5.3.3.5)
JAN marking (see 5.3.3.8)
*Classification of inspections (see 5.3.4.3)
*Toxicological formulation (see 5.3.4.4)
*Inspection conditions (see 5.3.4.5)
*Inspection of packaging (see 5.3.4.13)
Data requirements (see 5.3.6.5)
*First article note (see 5.3.6.6)
Qualification note (see 5.3.6.8)
*Condition for use of level B preservation (see 5.3.6.10)
Government-furnished and government-loaned property (see 5.3.6.12)
Material safety data sheet (see 5.3.6.13)
Patent notice (see 5.3.6.14)
International standardization agreement (see 5.3.6.17)
Changes from previous issue (see 5.3.6.18)

FIGURE 2. List of standard paragraphs

1. SCOPE

1.1 Scope. This specification covers the general requirements and tests for radiofrequency connectors used with flexible RF cables and certain other types of coaxial transmission lines.

1.2 Classification. Connectors shall be of the following classes and categories as specified (see 6.2).

1.2.1 Class The class of connectors shall consist of the following:

a. Class 1 - A class 1 connector is a connector which is intended to provide superior RF performance at specified frequencies, and for which all RF characteristics are completely defined.

b. Class 2 - A class 2 connector is intended to provide mechanical connection within an RF circuit providing specified RF performance.

1.2.2 Categories. The categories of connectors shall be designated by an A (field serviceable), B (non-field replaceable), C (field replaceable solder center contact), D (field replaceable crimp center contact) and E (field replaceable) as follows:

a. Category A - Connectors which do not require special tools to assemble shall be designated as category A connectors. Standard wrenches, soldering equipment, pliers, etc., are not defined as special tools.

b. Category B - Connectors which require special tools to assemble shall be designated as category B connectors. These connectors may be used for original installations. Field replacement is intended to be made by category A or C connectors. Category B connectors will not be stocked or procured by the Government.

c. Category C - Connectors which require only standard military crimping tools and standard cable stripping dimensions to assemble shall be designated as category C connectors. The standard military crimping tool shall be as specified (see 6.2).

d. Category D - Connectors which require only standard military crimp tools for the center contact and outer ferrule, and standard cable stripping dimensions to assemble shall be designated as category D connectors. The standard military crimp tools shall be as specified (see 6.2).

e. Category E - Connectors using semi-rigid cables with standard stripping dimensions and using standard military tools.

FIGURE 3. Example of section 1.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

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

SPECIFICATIONS

FEDERAL

Q-F-499	-	Flux, Brazing, Silver Alloy, Low Melting Point.
QQ-B-626	-	Brass, Leaded and Non-Leaded, Rod, Shaped, Forgings, and Flat Products With Finished Edges (Bar and Strip).
QQ-B-654	-	Brazing, Alloys, Silver.
QQ-C-530	-	Copper-Beryllium Alloy Bars, Rods, and Wire.
QQ-S-365	-	Silver Plating, Electrodeposited, General Requirement for.
QQ-S-571	-	Solder, Tin Alloy, Lead-Tin Alloy and Lead Alloy.
QQ-S-637	-	Steel Bar, Carbon, Cold Finished (Standard Quality Free Machining).
TT-S-735	-	Standard Test Fluids; Hydrocarbon.
VV-F-800	-	Fuel Oil, Diesel.

MILITARY

MIL-G-5572	-	Gasoline, Aviation, Grades 80/87, 100/130, 115/145.
MIL-H-5606	-	Hydraulic Fluid, Petroleum Base, Aircraft, Missile, and Ordnance.
MIL-T-5624	-	Turbine Fuel, Aviation, Grades JP-4 and JP-5.
MIL-L-6081	-	Lubricating Oil, Jet Engine.
MIL-L-7808	-	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base.
MIL-C-22520	-	Crimping Tools, Terminal, Hand or Power Actuated, Wire Termination, and Tool Kits.
MIL-F-25656	-	Fuel, Aircraft Turbine and Jet Engine, Grade JP-6.
MIL-C-26074	-	Coating, Electroless Nickel, Requirements for.
MIL-G-45204	-	Gold Plating (Electrodeposited).

FIGURE 4. Example of section 2.

MIL-S-45743 - Soldering, Manual Type, High Reliability, Electrical, Electronic, Instrument, Communication, and Radar for Aerospace, and Control Systems, Procedures for.
MIL-C-55330 - Connectors, Electrical and Fiber Optic, Packaging of.

(See supplement 1 for list of associated specifications)

STANDARDS

FEDERAL

FED-STD-H28 - Screw Thread Standards For Federal Services.

MILITARY

MIL-STD-130 - Identification Marking of U.S. Military Property.
MIL-STD-454 - Standard and General Requirements for Electronic Equipment.
MIL-STD-1344- Test Methods for Electrical Connectors.

(Unless otherwise indicated, copies of the federal and military specifications, standards, and handbooks are available from the Naval Publications and Forms Center, (ATTN: NPODS), 5801 Tabor Avenue, Philadelphia, PA 19120-5099.

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

United States Government Printing Office

GPO - Style Manual

(Copies of the GPO Style Manual are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-0001.)

FIGURE 4. Example of section 2 - Continued.

2.2 Non-Government publications. The following document forms a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 484 - Bars, Billets and Forgings, Stainless and Heat-Resisting, General Requirement for (DoD adopted)

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1137.)

(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.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

FIGURE 4. Example of section 2 - Continued.

3. REQUIREMENTS

3.1 Specification sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheets. In the event of any conflict between requirements of this specification and the specification sheets, the latter shall govern.

3.2 Qualification. Lead sockets furnished under this specification shall be products which are authorized by the qualifying activity for listing on the applicable qualified products list at the time of award of contract (see 4.5 and 6.3).

3.3 Material. The material shall be as specified herein. However, when a definite material is not specified, a material shall be used which will enable the sockets to meet the performance requirements of this specification. Recovered material shall be used to the maximum extent possible.

3.3.1 Sockets contacts and terminals. Material for socket contacts shall be as specified (see 3.1).

3.3.1.1 Plating. The lead socket contact and the lead socket sleeve and terminal shall be gold plated in accordance with MIL-G-45204 over nickel plating in accordance with QQ-N-290. The type, grade and class (thickness) shall be as specified (see 3.1). Gold inlay over nickel is also acceptable. Thickness of the inlay and the gold purity and hardness shall be as specified (see 3.1). Tin or bright acid tin in accordance with MIL-T-10727, type I, a minimum of 180 microinches thick is permitted with copper underplate in accordance with MIL-C-14550, for the lead socket sleeve and terminal. Silver shall not be used as an underplate.

3.4 Design and construction. Sockets shall be of the design, construction and physical dimensions specified (see 3.1). The entry to the socket shall be beveled, chamfered or tapered to facilitate the engagement of the component lead into the socket (see 6.7). The socket contact shall be of beryllium copper in accordance with QQ-C-530, QQ-C-533, or QQ-C-576. The lead socket sleeve and terminal shall be of machined one piece construction. The material shall be brass in accordance with QQ-B-626. The body shall provide a means of retention to a mounting board as specified (see 3.1).

3.4.1 Wire termination. Unless otherwise specified, wire terminations shall conform to figure 1 and shall be as specified (see 3.1).

3.4.1.1 Solderable terminals. Terminals intended for soldering shall be designed so that there shall be no solder wicking into the lead engagement chamber.

FIGURE 5. Example of section 3.

3.4.1.2 Solderless wrap terminals. Type I terminals intended for solderless wrap applications shall conform to the requirements of MIL-STD-1130.

3.4.1.3 Mounting hardware. Mounting hardware shall be selected from AN, NAS, MS, or commercial standards.

3.5 Performance.

3.5.1 Mating force. The maximum mating force shall be as specified (see 3.1 and 4.7.2).

3.5.2 Unmating force. The spring contact within the socket shall hold the test pin with the 0.5 ounce minimum withdrawal force applied (see 4.7.3).

3.5.3 Socket retention. There shall be no damage or loosening of the socket from the mounting board after the socket retention test (see 4.7.4).

3.5.4 Contact resistance. The initial contact resistance shall be not greater than 15 milliohms and after the durability and corrosive atmosphere test, the contact resistance shall be not greater than 30 milliohms (see 4.7.5).

3.5.5 Terminal strength (type I only). Testing of terminals shall not result in damaging of the terminal or the socket contact (see 4.7.6.1 through 4.7.6.2).

3.5.6 Vibration. During vibration, there shall be no interruption in continuity greater than 1 microsecond of the test circuit which incorporates mated contacts. There shall be no physical or mechanical damage to the mounted socket contacts. After the test, the sockets shall meet the contact resistance requirement of 3.5.4 and the contact withdrawal force requirement of 3.5.2 (see 4.7.7).

3.5.7 Mechanical shock. During the test there shall be no interruption in continuity greater than 1 microsecond of the test circuit which incorporates mated contacts. There shall be no physical damage to the socket (see 4.7.8).

3.5.8 Socket durability. After 50 insertions and removals, sockets shall show no evidence of cracking or breaking. The socket shall meet the contact resistance requirement of 3.5.4 and the contact withdrawal force requirement of 3.5.2 (see 4.7.9).

3.5.9 Thermal shock. There shall be no evidence of physical damage to the socket. The socket shall be capable of being mated with the maximum test gauge without damage to the socket or the gauge (see 4.7.10).

FIGURE 5. Example of section 3 - Continued.

3.5.10 Low-level circuit. The socket shall show no electrical discontinuity and the contact resistance requirement of 3.5.4 shall not be exceeded (see 4.7.11).

3.5.11 Corrosive atmosphere. There shall be no evidence of porous plating or exposure of base metal on the contacting surfaces, and the contact resistance requirement of 3.5.4 shall not be exceeded (see 4.7.12 and 6.5.1).

3.5.12 Solderability (except type I terminals). Terminations shall withstand the test (see 4.7.13).

3.5.13 Resistance to soldering heat (except type I terminals). Sockets shall withstand the test without damage. There shall be no solder wicking into the lead engagement area (see 4.7.14).

3.5.14 Salt spray. There shall be no visual signs of corrosion or corrosive salts on the base metal (see 4.7.15). The socket shall then meet the requirements of 3.5.10.

3.5.15 Spring contact retention. During testing, the spring contact shall not separate from the socket sleeve (see 4.7.16).

3.6 Marking. Sockets shall be marked in accordance with method I of MIL-STD-1285, and shall include the military part number (see 3.1), the manufacturer's name or code symbol, and date code. The marking shall be on the package.

3.7 Workmanship. Sockets shall meet all design dimensions and intermateability requirements of this specification. Loose contacts, poor molding fabrication, loose materials, defective bonding, damaged or improperly assembled contacts, peeling, or chipping of plating or finish, galling of mating parts, nicks and burrs of metal parts, and post molding warpage will be considered adequate basis for rejection of items being of inferior quality for the purpose intended. Emphasis shall be on the quality of the molded dielectric retention system parts.

FIGURE 5. Example of section 3 - Continued.

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 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 inspections. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.3).

b. Quality conformance inspection (see 4.4).

4.3 First article inspection. First article inspection shall be performed on one complete pumping assembly when a first article sample is required (see 3.1 and 6.2). This inspection shall include the examination of 4.5 and the tests of 4.6.1 through 4.6.6.

4.4 Quality conformance inspection. Quality conformance inspection shall include the examination of 4.5 and the tests of 4.6.1 and 4.6.4.

4.5 Examination. Each pumping assembly shall be examined for compliance with the requirements specified in 3.2 through 3.5. 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 the specified requirements shall receive particular attention for adequacy and suitability. This element of inspection shall encompass all visual examinations and dimensional measurements. Noncompliance with any specified requirements or presence of one or more defects preventing or lessening maximum efficiency shall constitute cause for rejection.

FIGURE 6. Example of section 4.

4.6 Methods of inspection.

4.6.1 Hydrostatic. The pump and fittings shall be subjected to a hydrostatic test gauge pressure of 300 lb/in^2, for a period of 5 minutes to determine conformance to 3.6.2.

4.6.2 Performance.

4.6.2.1 Test conditions. All data shall be corrected to sea level conditions, barometric pressure 29.92 inches of mercury, for JP-5 and Navy special fuels at 60°F at a specific gravity of 0.80 and 0.98 respectively. Water at a temperature of 60°F to 80°F shall be used as a test fluid.

4.6.2.2 Pumping. The pump shall be operated as specified herein to determine pump brake horsepower required, pump efficiency, and the net positive suction head required, based on the data obtained. The resultant data shall be used to plot the corrected performance characteristics of the performance chart (see 3.8). The test shall be conducted in accordance with the Hydraulic Institute Standards of the HI, Centrifugal Pump Section. Performance at rates less than those specified in 3.6.1 shall constitute failure of this test.

4.6.3 Operational test. The pumping assembly shall be operated for 24 hours at the rated conditions specified in 3.6.1. The pump shall be examined at the end of each 8 hour interval during the 24 hours. Maintenance and minor adjustments shall be permitted during the examination periods. The pump shall be examined during the operation for leakage through the pump casing or the shaft seals and for malfunction of any component. Any leakage attributes to defects in design, workmanship, materials, or to the malfunction of any component, or inability of the pump to deliver the minimum capacities specified herein shall constitute failure of this test.

4.6.4 Functional test. The pump shall be operated 1 hour at rated capacity under the conditions specified in 3.6.1 and shall be operated as required to verify the functional operation of the controls. The control functions shall be in accordance with the applicable requirements of 3.7.

4.6.5 Tilted position. The pumping assembly shall be operated for not less than 30 minutes while it is positioned 15 degrees from level along the longitudinal centerline of the skid base. Evidence of malfunction or misalignment of components shall constitute failure of this test.

4.6.6 Cold starting. The pumping assembly shall be placed in a cold chamber at 20°F for 48 hours or until stabilization temperature is reached. The system shall demonstrate three successive starting cycles without the use of external power. Sufficient time shall be allowed so that components can return to 20°F equilibrium.

4.6.7 Packaging inspection. The preservation, packing, and marking shall be inspected to verify conformance to the requirements of Section 5.

FIGURE 6. Example of section 4 - Continued.

5. PACKAGING

5.1 Preservation. Preservation shall be levels A or C, as specified (see 6.2).

5.1.1 Level A.

5.1.1.1 Cleaning. Modules shall be cleaned in accordance with MIL-P-116, process C-1.

5.1.1.2 Drying. Modules shall be dried in accordance with MIL-P-116.

5.1.1.3 Preservative application. Preservatives shall not be used.

5.1.1.4 Unit packs. Each module shall be individually unit packed in accordance with submethod IA-8 of MIL-P-116 in a bag or envelope in accordance with MIL-B-117, type I, class F, style 1. To avoid capacitor effects, each bag or envelope shall be fabricated from a continuous piece of barrier material. Cushioning shall be in accordance with PPP-C-1842, type III or PPP-C-7951, class 2. Each unit exceeding 30 cubic inches shall be placed in a supplementary container in accordance with variety 2 of PPP-B-566 or PPP-B-676 or the weather resistant class of PPP-B-636.

5.1.1.5 Intermediate packs. Unit packs not exceeding 30 cubic inches in size shall be placed in intermediate containers in accordance with variety 2 of PPP-B-566 or PPP-B-676 or the weather resistant class of PPP-B-636. Intermediate containers shall be uniform in size, shape and quantities, shall be of minimum tare and cube and shall contain multiples of five unit packs, not to exceed 100 unit packs. No intermediate packs are required when the total quantity shipped to a single destination is less than 100 unit packs or when supplementary containers are used.

5.1.2 Level C. Except as specified herein, the level C preservation for modules shall in accordance with the MIL-STD-2073-1 requirements for this level. Wrapping and cushioning materials shall be nonstatic generating and noncorrosive and shall not crumble, flake, powder or shed.

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

FIGURE 7. Example of section 5.

5.2.1 Level A. Modules, preserved as specified in 5.1, shall be packed in wood containers in accordance with PPP-B-601, overseas type or PPP-B-621, class 2. Closure and strapping shall be in accordance with the applicable container specification except that metal strapping shall in accordance with QQ-S-781, type I, finish A. The requirements for level B packing shall be used when the total quantity of a stock numbered module for a single destination does not exceed a packed volume of one cubic foot.

5.2.2 Level B. Modules, preserved as specified in 5.1, shall be packed in fiber-board containers in accordance with PPP-B-636, class weather resistant, style optional, special requirements. The requirements for box closure, waterproofing and reinforcing shall be in accordance with method V of the PPP-B-636 appendix.

5.2.3 Level C. Modules, preserved as specified in 5.1, shall be packed in fiber-board containers in accordance with PPP-B-636, class domestic, style optional, special requirements. Closures shall be in accordance with the PPP-B-636 appendix.

5.3 Marking.

5.3.1 Standard marking. In addition to any special or other identification marking required by the contract (see 6.2), each unit, supplementary, intermediate and exterior container shall be marked in accordance with MIL-STD-129. The complete military or contractor's type or part number, as applicable, shall be marked on all unit, supplementary and intermediate packs in accordance with the identification marking provisions of MIL-STD-129.

5.3.2 Special marking. In addition to the marking requirements of 5.3.1 and regardless of the level or type of packaging specified, all unit, supplementary, intermediate and exterior containers shall be marked as specified for sensitive electronic devices in MIL-STD-129.

5.4 General.

5.4.1 Exterior containers. Exterior containers (see 5.2.1, 5.2.2 and 5.2.3) shall be of a minimum tare and cube consistent with the protection required and shall contain equal quantities of identical stock numbered items to the greatest extent practicable.

5.4.2 Packaging inspection. The inspection of these packaging requirements shall be in accordance with 4.4.10.

FIGURE 7. Example of section 5 - Continued.

6. NOTES

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

6.1 Intended use. The compressors covered by this specification are intended for use in shipboard fire fighting applications. They are not for use with potable water.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.

b. Type, style, material grade, and heat treatment or condition of fasteners (see 1.2, 3.1, 3.2, and tables I, II, and III).

c. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).

d. When first article is required (see 3.1).

e. Zinc plating, if required (see 3.2).

f. Size, length (for bolts and studs), thread series, and class of fit (see 3.4.1 and 3.4.4.2).

g. Whether lot A or B testing is required (see 4.2.1).

h. Levels of preservation and packing (see 5.1 and 5.2).

6.3 Consideration of data requirements. The following data requirements should be considered when this specification is applied on a contract. The applicable Data Item Descriptions (DID's) should be reviewed in conjunction with the specific acquisition to ensure that only essential data are requested/provided and that the DID's are tailored to reflect the requirements of the specific acquisition. To ensure correct contractual application of the data requirements, a Contract Data Requirements List (DD Form 1423) must be prepared to obtain the data, except where DOD FAR Supplement 27.475-1 exempts the requirement for a DD Form 1423.

FIGURE 8. Example of section 6.

Reference Paragraph	DID Number	DID Title	Suggested Tailoring
4.5	DI-T-2072	Reports, test	Use contractor format

The above DID's were those cleared as of the date of this specification. The current issue of DOD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL), must be researched to ensure that only current, cleared DID's are cited on the DD Form 1423.

6.4 First article. When first article inspection is required, the contracting officer should provide specific guidance to offerors whether the item(s) should be a first article sample, a first production item, or a standard production item from the contractor's current inventory and the number of items to be tested as specified in 4.4. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results and disposition of 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.

6.5 Supersession data. This specification supersedes MIL-C-1567A dated 31 March 1969, MIL-C-4585D dated 1 June 1956, and class 3 of MIL-C-9631B dated 23 May 1969.

6.6 Part or Identifying Number (PIN). The PIN to be used for compressors acquired to this specification are created as follows:

M	28970-	X	X	XX
Prefix to indicate military specification	Specification number	Type number (see 1.2)	Style letter (see 1.2)	Material grade (see 3.1)

FIGURE 8. Example of section 6 - Continued.

6.7 Subject term (key word) listing.

Cadmium plating
Compressor
Firefighting
Hose
Pump
Safety
Shipboard
Water
Zinc plating

6.8 Changes from previous issue. The margins of this specification are marked with asterisks 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.

FIGURE 8. Example of section 6 - Continued.

MIL-C-81580

APPENDIX

PROCEDURE FOR QUALIFICATION INSPECTION

10. SCOPE

10.1 Scope. This appendix details the procedure for submission of samples, with related data, for qualification inspection of coils covered by this specification. The procedure for extending qualification of the required sample to other coils covered by this specification is also outlined herein. This appendix is a mandatory part of the specification. The information contained herein is intended for compliance.

20. APPLICABLE DOCUMENTS

This section is not applicable to this appendix.

30. SUBMISSION

30.1 Sample.

30.1.1 Single-type submission. A sample consisting of 151 sample units of each core material, class, and individual inductance value for which qualification is sought shall be submitted. Ten additional sample units shall be submitted for the fungus test if certification is not provided.

30.1.2 Combined-type submission. A sample consisting of 142 sample units of the lowest inductance value and 142 sample units of the highest inductance value for each class covered by a single specification sheet for which qualification is sought shall be submitted. Nine additional samples of any inductance value shall be submitted for group III tests. Ten additional sample units of any inductance value shall be submitted for the fungus test if certification is not provided.

30.2 Description of items. The manufacturer shall submit a detailed description of the coils being submitted for inspection, including the material used for the coil form, encapsulation of molding, type of winding, wire size, and insulation.

40. EXTENT OF QUALIFICATION

40.1 Single-type. Qualification shall be restricted to the single "M" part number submitted.

40.2 Combined-type submission. Qualification shall be restricted to all of the inductance values covered on a single specification sheet within the values passing qualification inspection.

FIGURE 9. Example of an appendix.

INCH-POUND

MIL-F-23419C
SUPPLEMENT 1
17 August 1977

MILITARY SPECIFICATION

FUSES, INSTRUMENT TYPE

GENERAL SPECIFICATION FOR

This supplement forms a part of MIL-F-23419C, dated 17 August 1977.

SPECIFICATION SHEETS

MIL-F-23419/1	-	Fuse, Instrument Type, Style FM01 (Indicating).
MIL-F-23419/2	-	Fuse, Instrument Type, Style FM02 (Indicating).
MIL-F-23419/3	-	Fuse, Instrument Type, Style FM03 (Nonindicating).
MIL-F-23419/4	-	Fuse, Instrument Type, Style FM04 (Nonindicating).
MIL-F-23419/6(EC)	-	Fuse, Instrument Type, Style FM06 (Nonindicating).
MIL-F-23419/7(EC)	-	Fuse, Instrument Type, Style FM07 (Subminiature-High Performance).
MIL-F-23419/8(EC)	-	Fuse, Instrument Type, Style FM08 (Subminiature-High Performance).

Preparing activity:
Navy - EC

Agent:
DLA - ES

AMSC N/A 1 of 1 FSC 5920

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

FIGURE 10. Example of supplement to a general specification.

INCH-POUND

MIL-F-28861
AMENDMENT 3
14 February 1984
SUPERSEDING
AMENDMENT 2
4 August 1983

MILITARY SPECIFICATION

FILTERS AND CAPACITORS, RADIO FREQUENCY/
ELECTROMAGNETIC INTERFERENCE SUPPRESSION,
GENERAL SPECIFICATION FOR

This amendment forms a part of MIL-F-28861, dated 17 December 1981, and is approved for use by all Departments and Agencies of the Department of Defense.

PAGE 5

* 3.6.6: Delete and substitute:

"3.6.6 Capacitor elements (Class S filters only). Capacitor elements used in the construction of Class S filters shall be manufactured and tested to MIL-C-123 as follows:

a. Capacitors shall meet the applicable requirements of MIL-C-123 except for qualification.

b. Capacitors shall be manufactured with lot control, in-process controls, and the groups A and B inspections of MIL-C-123. The group B thermal shock test and subsequent life test shall not be performed.

c. The conditions listed above shall be specified to an approved baseline documentation."

PAGE 19

4.6.3d, line 2: Delete "30 mA minimum" and substitute "35 mA maximum."

AMSC N/A 1 of 3 FSC 59GP
DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

FIGURE 11. Example of an amendment.

MIL-F-28861
AMENDMENT 3

PAGE 21

4.6.11: Add the following sentence:

"Lead wires specified in accordance with table VII, shall be the smaller of the wire specified per table VII or the actual lead wire size of the filter terminal."

The attached insertable replacement pages listed below are replacements for stipulated pages. When the new pages have been entered in the document, insert the amendment as the cover sheet to the specification.

Replacement page	Page replaced
23	23
24	Reprinted without change
31	Reprinted without change
32	32
35	35
36	36

PAGE 32

* 40.1: Add the following paragraphs:

"d. Capacitance - Capacitance range qualification for a given style and circuit configuration will be restricted to values equal to and less than the capacitance value submitted.

e. Product assurance level - Qualification to Class S filters will extend qualification to Class B filters of the same voltage rating, current rating, capacitance, insertion loss, and physical configuration."

2

FIGURE 11. Example of an amendment - Continued.

MIL-F-28861
AMENDMENT 3

PAGE 35

Add as new paragraph 30.1.1:

"30.1.1 Optional qualification for Class S filters. The following option for Class S qualification is available to any manufacturer who has a product currently qualified under this specification. Products proposed for qualification under this procedure shall meet the following requirements:

a. Product shall pass the Class S product audit.

b. Product shall meet Class S designated product control requirements.

c. Product shall meet all the Class S requirements and tests of Group A and B."

NOTE: The margins of this amendment are marked with asterisks 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 - ER
Navy - EC
Air Force - 85
NASA - NA

Review activities:
Army - AR, MI
Air Force - 11, 17, 99
DLA - ES

User activities:
Army - ME, AT, AV
Navy - CG, MC, AS, OS, SH
Air Force - 19

Preparing activity:
Navy - EC

Agent:
DLA - ES

(Project 5915-0303)

3

FIGURE 11. Example of an amendment. - Continued.

INCH-POUND

MIL-I-2819F
INTERIM AMENDMENT 1(SH)
14 August 1980

MILITARY SPECIFICATION

INSULATION BLOCK, THERMAL

This interim amendment is approved for use within the Naval Sea Systems Command, Department of the Navy, with MIL-I-2819F, dated 7 October 1975.

PAGE 3

3.7, last line: Delete "1 hour" and substitute "2 hours".

PAGE 5

4.5.10, line 2: Delete "1/4-inch layer" and substitute "1/8-inch layer".

Preparing activity:
Navy - SH

(Project 5640-N047)

AMSC N/A 1 of 1 FSC 5640

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

FIGURE 12. Example of an interim amendment.

NOTICE
OF VALIDATION

METRIC

MIL-A-12345C
NOTICE 1
12 August 1985

MILITARY SPECIFICATION
(TITLE)

MIL-A-12345C, dated 5 June 1980, has been reviewed and determined to be valid for use in acquisition.

Custodians:
Army - MR
Navy - AS
Air Force - 20

Preparing activity:
Army - MR

AMSC N/A

FSC 9510

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

FIGURE 13. Example of a validation notice.

INCH-POUND

NOTICE
OF VALIDATION

MIL-V-XXXX
NOTICE 2
23 April 1986

MILITARY SPECIFICATION

VALVES, BOILER

MIL-V-XXXX remains inactive for new design, however, the document is valid for acquisition when needed.

Preparing activity:
Navy-SH

AMSC N/A FSC 4820

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

FIGURE 14. Example of validation notice for inactive for new design.

INCH-POUND

NOTICE OF INACTIVATION
FOR NEW DESIGN

MIL-R-22684/5A(USAF)
NOTICE 1
20 May 1969

MILITARY SPECIFICATION SHEET

RESISTORS, FIXED, FILM, INSULATED
STYLE RL07....TX

This notice should be filed in front of MIL-R-22684/5A(USAF)
dated 7 September 1967.

MIL-R-22684/5A(USAF) is inactive for new design and is no longer used by the Air Force except for replacement purposes.

The Qualified Products List (QPL) associated with this inactive for new design specification will be maintained until acquisition of the product is no longer required whereupon the specification and QPL will be canceled.

Preparing activity:
Air Force - 11

(Project 5905-8620)

AMSC N/A FSC 5905

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

FIGURE 15. Example of inactive for new design notice.

INCH-POUND

NOTICE
OF CANCELLATION

MIL-C-13701B(ME)
NOTICE 1
24 August 1979

MILITARY SPECIFICATION

COMPRESSORS, RECIPROCATING, POWER DRIVEN

(FOR DIESEL ENGINE STARTING)

MIL-C-13701B(ME), dated 31 August 1971, is hereby canceled without replacement.

Preparing activity:
Army - ME

(Project 4310-A123)

AMSC N/A

FSC 4310

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

FIGURE 16. Example of a cancellation notice.

INCH-POUND

NOTICE
OF CANCELLATION

MIL-M-45207B(MR)
NOTICE 1
24 October 1979

MILITARY SPECIFICATION

MAGNESIUM ALLOY (K1A), SAND CASTINGS

MIL-M-45207B(MR), dated 25 May 1966, is hereby canceled. Future acquisitions for this material should refer to the portions of ASTM B-80, Magnesium-Alloy Sand Castings, which pertain to alloy designation K1A (UNS M18010).

(Application for copies of ASTM publications should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia PA 19103-1187.)

Preparing activity:
Army - MR

(Project MECA-A008)

AMSC N/A AREA MECA

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

FIGURE 17. Example of a cancellation notice with superseding document.

INCH-POUND

NOTICE
OF REINSTATEMENT

MIL-H-28719
NOTICE 2
13 August 1979
SUPERSEDING
NOTICE 1
3 September 1976

MILITARY SPECIFICATION

HEADERS, HERMETICALLY SEALED

MIL-H-28719, dated 31 March 1970, is hereby reinstated and may be used for acquisition. The Naval Sea Systems Command (OS) hereby assumes preparing activity responsibility in lieu of the Naval Electronic Systems Command (EC).

(Copies of the referenced federal and military specifications, standards, and handbooks are available from the Department of Defense Single Stock Point, Naval Publications and Forms Center (ATTN: NPODS), 5801 Tabor Avenue, Philadelphia, PA 19120-5099.)

Custodians:
Army - ER
Navy - OS
Air Force - 85

Preparing activity:
Navy - OS

(Project 5940-1120)

AMSC N/A

FSC 5940

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

FIGURE 18. Example of reinstatement notice.

INCH-POUND

MIL-C-915/21E
18 June 1985
SUPERSEDING
MIL-C-915/21D
5 April 1973

MILITARY SPECIFICATION SHEET

CABLE, ELECTRICAL, 125 VOLTS, TYPE TRXF

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

The requirements for acquiring the product described herein shall consist of this specification sheet and the issue of the following specification listed in that issue of the Department of Defense Index of Specifications and Standards (DODISS) specified in the solicitation: MIL-C-915

REQUIREMENTS:

Qualification not required.

Construction (non-watertight)

First - Copper conductor, uncoated, class M stranding (see table I for size)
Second - Separator.
Fifth - Polychloroprene jacket (see table I for dimensions).

TABLE I. Details.

Type and size	Conductor size AWG	Overall diameter maximum (inch)	Conductor resistance per 100 feet maximum (ohms)
TRXF-84	1 (class M)	0.60	0.137
TRXF-105	0 (class M)	.68	.108
TRXF-133	00 (class M)	.75	.0867

AMSC N/A FSC 6145

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

1 of 3

FIGURE 19. Example of a specification sheet.

MIL-C-915/21E

EXAMINATION AND TESTS:	Requirements
Basic electrical:	
Conductor resistance - ohms/1000 feet at 25°C, maximum. . .	(see table I)
Voltage withstand - conductor to ground, volts, root mean square, minimum	1200
Insulation resistance 1- megohms/1000 feet, minimum conductor to water	350
Group A:	
Visual and dimensional	No failure
Group B:	
Cold bending, cable - at minus 30+2°C, two turns around mandrel with diameter twice that of specimen	No damage
Physicals (unaged)	
Jacket (cable)	
Tensile strength - lb_f/in^2, minimum	1800
Elongation - percent, minimum	300
Set - inch, maximum	3/8
Group C:	
Flammability - inches, maximum	2
Physicals (aged)	
Jacket (cable)	
Air pressure heat	
Tensile strength - percent of unaged, minimum	50
Elongation - percent of unaged, minimum.	50
Hot oil immersion	
Tensile strength - percent of unaged, minimum	60
Elongation - percent of unaged, minimum	60

UNIT ORDERING LENGTH:
All sizes 1000 feet (nominal).

Revision letters are not used to denote changes due to the extensiveness of the changes.

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FIGURE 19. Example of a specification sheet - Continued.

MIL-C-915/21E

Custodians:
Army - MI
Navy - SH
Air Force - 85

Review activities:
Army - CR, ER
Navy - EC
Air Force - 99
DLA - IS

User activities:
Army - AL, AR, ME
Navy - CG

Preparing activity:
Navy - SH

(Project 6145-0885-19)

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FIGURE 19. Example of a specification sheet - Continued.

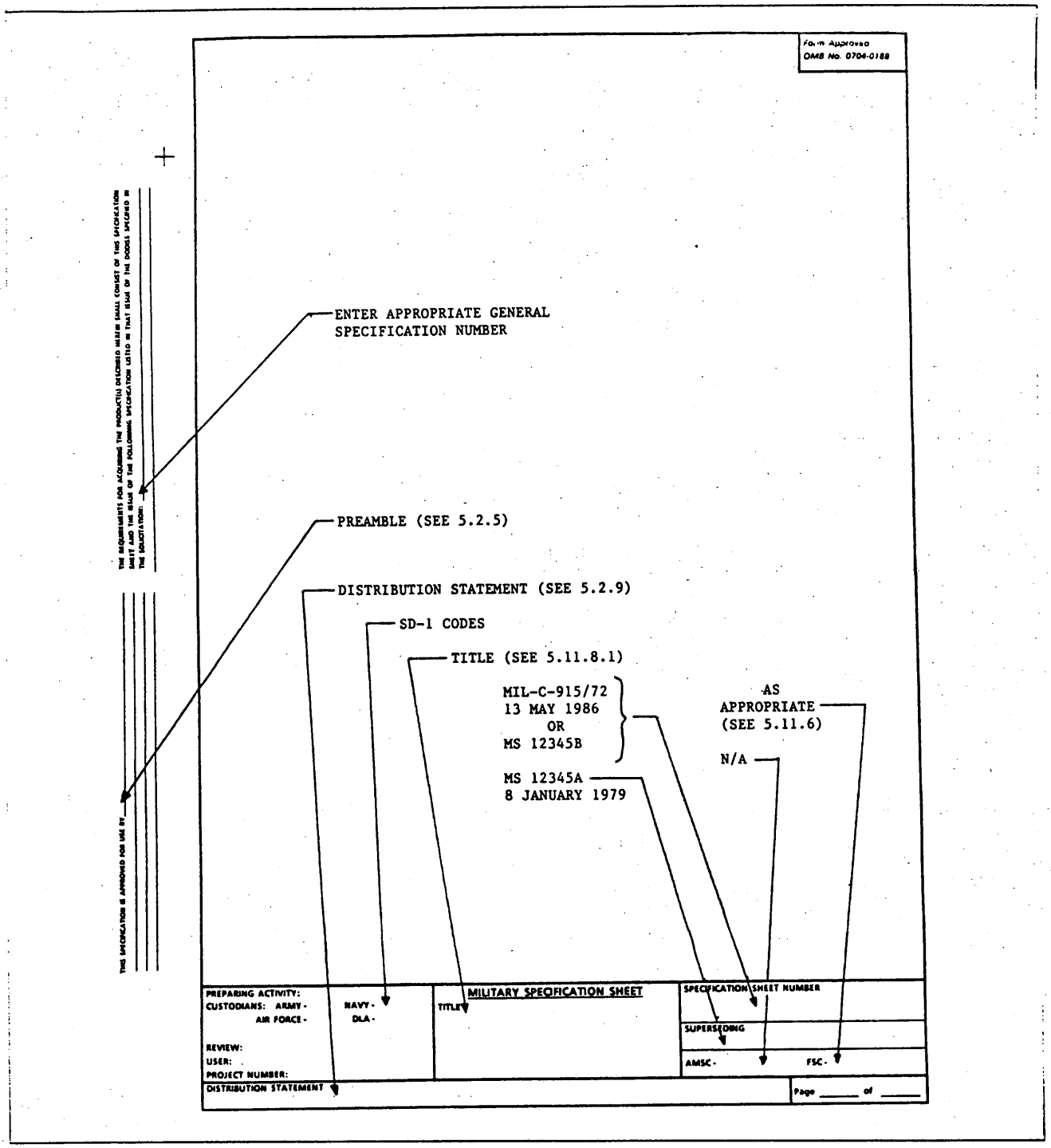

FIGURE 20. Example of a specification sheet using DD Form 672.

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CONCLUDING MATERIAL

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Navy - SH
Air Force - 11
DLA - DH

Review activities:
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Navy - AS, EC, MC, OS, SA, YD
Air Force - 10, 14, 16, 17, 19, 23, 26, 43, 69, 85, 99
DLA - CS, CT, DM, DP, ES, GS, IP, IS, PS, SS
DNA - DS

User activities:
Army - CE, MT, TM
Navy - CG
Air Force - 68, 70, 79, 82

Preparing activity:
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Agent:
DLA - ES

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