THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

MIL-STD-794E
16 July 1982
SUPERSEDING
MIL-STD-794D
15 DECEMBER 1972

MILITARY STANDARD

PARTS AND EQUIPMENT,

PROCEDURES FOR PACKAGING OF

NO DELIVERABLE DATA
REQUIRED BY THIS DOCUMENT

AREA PACK

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

DEPARTMENT OF DEFENSE

Washington, D.C. 20301

Parts and Equipment, Procedures for Packaging of

MIL-STD-794E

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

2. Recommended corrections, additions, or deletions should be addressed to the Commanding Officer, Naval Air Engineering Center, Code 9321, Lakehurst, NJ 08733 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

FOREWORD

This standard was prepared in order to provide acceptable materials, containers and processes for the packaging of parts and equipment while at the same time controlling variety without sacrifice to economy. The standard further provides:

a. Procedures for determining the methods of MIL-P-116.

b. Procedures required to select packaging materials for parts and equipment.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

CONTENTS

Paragraph		Page
1.	SCOPE	1
1.1	Scope	1
1.2	Application	1
2.	REFERENCED DOCUMENTS	1
2.1	Issues of documents	1
3.	DEFINITIONS	1
3.1	Critical items	1
3.2	Noncritical items	1
3.3	Electrical hardware	1
3.4	Electrical items	2
3.5	Electrically balanced or calibrated	2
3.6	Electronic parts susceptible to damage by environmental field forces	2
3.7	Fragility factor	2
3.8	Degrees of protection	3
3.9	Packaging terminology	5
3.10	Packaging design validation	6
3.11	Prototype pack	6
3.12	Repairable item	6
3.13	Repairable-unserviceable item	6
3.14	Reusable containers	6
3.15	Types of load	7
3.16	Modular containers	8
3.17	Container Design Retrieval System (CDRS)	8
3.18	Sealed	8
4.	GENERAL REQUIREMENTS	8
4.1	General	8
4.2	New items and materials	8
4.3	Packaging design drawings	9
4.4	Reusable containers	9
4.5	Unpacking instructions	9
5.	DETAILED REQUIREMENTS	10
5.1	Preservation	10
5.2	Packing	11
5.3	Specific considerations	18
5.4	Unit container	20
5.5	Lumber and plywood	20
5.6	Kits	22
5.7	Marking	22
5.8	Hazardous material shipment	22
5.9	Packaging design validation	22
5.10	Packaging data forms	23
5.11	Security assistance material	23

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

CONTENTS (Continued)

Paragraph		Page
6.	NOTES	23
6.1	Contractual requirements	23

TABLES

Table		
I	Exterior shipping containers - selection by maximum weight of contents and levels of protection	14
II	Interior containers - selection by weight of contents and size of container	21

APPENDICES

Appendix A. MATERIAL AND CONTAINER DOCUMENTS

Paragraph		Page
10.	Scope	25

Appendix B. PROCESS DOCUMENTS

Paragraph		Page
10.	Scope	41

Appendix C. QUALITY ASSURANCE AND PACKAGING DESIGN VALIDATION PROVISIONS

Paragraph		Page
10.	Quality assurance and packaging design validation provisions	49
10.1	Responsibility for inspection	49
10.2	Classification of inspections and tests	49
10.3	Packaging design validation tests	49
10.4	Quality conformance inspection	50
10.5	Test methods	51
10.6	Disposition of samples after test	52
10.7	Marking of containers for free-fall drop tests	52
10.8	Sequence of free-fall drop tests for Procedures B and E	52

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

CONTENTS (Continued)

Appendix C. (Continued)

FIGURES

Figure		Page
1.	Marking the specimen container prior to test....	53

TABLES

Table		
I.	Rough handling tests	54

Appendix D. SELECTION OF PRESERVATION METHODS AND CODED DATA SYMBOLS

Paragraph		Page
10.	Scope	57
10.1	Scope	57
10.2	Application	57
20.	Definitions	57
20.1	Categorization	57
20.2	Common group items	58
20.3	Unique group items	58
20.4	Special group items	58
20.5	"Manual" data preparation	58
20.6	"Machine Developed" data	58
20.7	Input data	58
20.8	Programmed data	58
20.9	Output data	58
30.	Categorization	58
30.1	Categorization	58
40.	Detailed requirements	61
40.1	Method of recording requirements	61
40.2	Formulas	62
40.3	Cushioning correlation	62
40.4	Container selection	62
40.5	Approximate fragility of various packaged items.	62

FIGURES

Figure		
1.	Cushioning correlations for drops of 30 inches..	63

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

CONTENTS (Continued)

Appendix D. (Continued)

TABLES

Table		Page
I.	Chemical and physical characteristics	64
Ia.	Group descriptions leading to basic MIL-P-116 methods	65
II.	Determination of method of MIL-P-116	66
III.	Table for selecting weight and fragility category	72
IV.	Table for selecting preservative category	74
V.	Examples of corresponding coded packaging data	75
VI.	Formulas for "bill of materials" determination	76
VII.	Exterior container selection guide	81
VIII.	Approximate fragility factors	83

Appendix E. PACKAGING OF KITS

Paragraph		Page
10.	Scope	85
20.	Preservation	85
20.1	Consolidation of different items within a method or submethod of preservation	85
20.2	Application of preservative compounds or oils	86
30.	Unit preservation	86
30.1	Physical protection	86
30.2	Segregation of items within packs	86
30.3	Skin packaging	86
40.	Packing	87
50.	Industrial packaging	87
60.	Marking and identification	87
60.1	Shipping containers	87
60.2	Hazardous materials	87
60.3	Additional marking	87
70.	Instructions for completion of kit contents list	88

FIGURES

Figure		Page
1.	Kit contents list	90

Appendix F. FACTORS AND FORMULAE ESTABLISHING QUP

Paragraph		Page
10.	Scope	91
20.	Determination of QUP	91
20.1	Repairable items	91

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

CONTENTS (Continued)

Appendix F. (Continued)

Paragraph		Page
20.2	Consumable items	91
20.3	Irregular configuration, delicate or fragile items	91
20.4	Pairs, sets, etc. items	91
20.5	Items unit packed in accordance with Method II	91
20.6	Kit	91
20.7	Lumber, raw stock, paints, oils, dope, etc.	91
20.8	Factors and formulae establishing QUP	91
30.	Quantity per unit pack determination formula	93
30.1	Formula A	93
30.2	Formula B	94

Appendix G. SELECTION OF MULTIAPPLICATION CONTAINERS

Paragraph		Page
10.	Scope	95
10.1	Application	95
20.	General requirements	95
20.1	Dynamic cushioning values	95
20.2	Item size range	95
20.3	Techniques to assure preservation/item integrity	95
30.	Detail requirements	96
30.1	Type and use	96
30.2	Identification of multiapplication containers	97
30.3	Coded data	97
30.4	Packaging design validation	97
40.	Availability	98
40.1	General Services Administration (GSA)	98
40.2	Aviation Supply Office	98
40.3	Commercial sources	98

TABLES

Table		
I.	Multiapplication container selection	99

Appendix H. RECOMMENDED FIBERBOARD CONTAINER SIZE LIST

Paragraph		Page
10.	Scope	109

TABLES

Table		
I.	Recommended fiberboard container size list	109

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

1. SCOPE

1.1 Scope. This standard provides procedures for packaging parts and equipment based on their material composition, surface finish, size, weight, fragility, configuration and the intended level of protection.

1.2 Application. It is intended that this standard be used in developing preservation and packing requirements, for assistance in developing Section 5 of commodity specifications and for preparing packaging requirements in contracts or orders.

2. REFERENCED DOCUMENTS

2.1 Issues of documents. The documents usually referenced in this section are included in this standard as Appendix A, Material and Container Documents and Appendix B, Process Documents.

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

3. DEFINITIONS

3.1 Critical items. Items meeting one or more of the following criteria are considered critical.

3.1.1 Critical chemically. Items which are of such a nature that any degree of deterioration (in the form of corrosion, stain, scale, mold, fungi, bacteria, etc.) caused by oxygen, moisture, sunlight, living organisms, temperature, time, and other contaminants, will result in premature failure or malfunction of the item, or equipment in which installed, or to which the item is interfaced.

3.1.2 Critical physically. Items of such a nature that a slight degree of physical action on the items or any integral surfaces thereof, renders them unfit for use. This includes items having a surface finish of 32 microinches (0.80 mm) root mean square (RMS) or less, requiring a high degree of cleanliness and freedom from contamination as well as those requiring special protection against shock, vibration, abrasion and distortion damage.

3.2 Noncritical items. All items not meeting the criteria set forth for critical items.

3.3 Electrical hardware. This category will include items eventually becoming part of an electrical component but not in all instances requiring the preservation or protection required of the end assembly, e.g., ground clamps, fuses, motor brush assemblies, etc.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

3.4 Electrical items. Electrical items are those items designed to generate, transmit, store or impede an electrical current.

3.5 Electrically balanced or calibrated. Items having characteristics that may vary with humidity or temperature changes, use, or age; requires periodic checks to assure that originally designed limits and characteristics are maintained.

3.6 Electronic parts susceptible to damage by environmental field forces. Devices for which many of the electrical characteristics are determined by temperature dependent rate of flow of electrons into ion "holes", with nomenclature such as microcircuits, semi-conductors, thin film resistors, and diodes, which may be damaged or altered in electrical characteristics by electrostatic, electromagnetic, magnetic or radioactive fields.

3.7 Fragility factor. Maximum force acceleration or deceleration expressed in units of gravity (G's) that can be applied to an item in its nonoperating state without causing physical damage or changes in its operational characteristics.

3.7.1 Delicate. A delicate item is one which is so constructed that light, moderate forces will either distort, displace or deform elements or portions of the item to the extent that malfunction or misfit of the item occurs. Examples of delicate items include finely balanced mechanisms, such as gyroscope equipment, potentiometers, galvanometers, devices containing filaments, and time and dimension measuring devices.

3.7.2 Flexible. A flexible item is one that, because of its assembly characteristics, material content, or disproportionate dimensional relationships will change its shape in some manner under very moderate pressure, including pressure which is exerted by the item itself when not fully supported over a major portion of its load-bearing surface. Examples of flexible items are chains, cables, certain gaskets, rubber items and wiring harnesses.

3.7.3 Fragile. A fragile item is one whose physical characteristics permit fracturing or shattering of the item when it is subjected to moderately light impact forces. Fragile items include those made of glass, plastic, and low tensile strength brittle metals which are rendered vulnerable to light impact forces by the fact that the materials of which they are made are both brittle and present in relatively thin cross sections.

3.7.4 Noncoilable. Items in this division have the physical characteristics of flexible items as described in 3.7.2 but have additional characteristics which will not permit the coiling without damage or permanent deformation. Examples of noncoilable items are thin metal shims, gaskets and items which are flexible only because of a very thin cross section in one or more dimensions.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

3.7.5 Rugged. A rugged item is one that is so constituted physically that extreme force must be exerted to change its shape in any way and which will be permanently marked, or damaged by such shape-changing forces.

3.8 Degrees of protection.

3.8.1 Maximum protection. Maximum protection, designated as level A, is the degree of preservation or packing required for protection of material against the most severe conditions known or anticipated to be encountered during shipment, handling, and storage. Preservation and packing so designated will be designed to protect material against direct exposure to extremes of climate, terrain, operational and transportation environments without protection other than that provided by the pack. The conditions to be considered include, but are not limited to:

a. Multiple handling during transportation and intransit storage from point of origin to ultimate user.

b. Shock, vibration and static loading during shipment.

c. Loading on shipdeck, transfer at sea, helicopter delivery, and offshore or over-the-beach discharge, to ultimate user.

d. Environmental exposure during shipment or during intransit operations where port and warehouse facilities are limited or nonexistent.

e. Extended open storage in all climatic zones.

f. Static loads imposed by stacking.

3.8.2 Intermediate protection. Intermediate protection, designated as level B, is the degree of preservation or packing required for protection of material under known favorable conditions during shipment, handling, and storage. Preservation and packing so designated will be designed to protect material against physical damage and deterioration during favorable conditions of shipment, handling, and storage. The conditions to be considered include, but are not limited to:

a. Multiple handling during transportation and intransit storage.

b. Shock, vibration, and static loading of shipment worldwide by truck, rail, aircraft or ocean transport.

c. Favorable warehouse environment for extended periods.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

d. Environmental exposure during shipment and intransit transfers, excluding deck loading and offshore cargo discharge.

e. Stacking and supporting superimposed loads during shipment and extended storage.

3.8.3 Minimum protection. Minimum protection, designated as level C, will be used whenever the prevailing logistic system permits use of this degree based upon the considerations stated herein. Level C is the degree of preservation or packing required for protection of material under conditions known to be less severe than those requiring level B. Preservation and packing designated level C will be designed to protect material against physical damage and deterioration during favorable conditions of shipment, limited handling and short term storage. When level C is specified it must reference applicable Public Laws (Code of Federal Regulations) or a specific Federal or Military Specification, Standard or Instruction. In general, the following criteria determine the requirements for this degree of protection:

a. Use or consumption of the item at the first destination.

b. Shock, vibration, and static loading during the limited transportation cycle.

c. Favorable warehouse environment for temporary periods (less than 6 months).

d. Effects of environmental exposure during shipment and intransit delays.

e. Stacking and supporting superimposed loads during shipment and temporary storage.

3.8.4 Industrial packaging. Industrial packaging will be utilized whenever logistic conditions justify its use. It may also be used to satisfy any degree of protection whenever the technical design details of the packaging meet all conditions of the level of protection specified. Industrial packaging must protect items against physical and environmental damage during shipment, handling, and storage. In general:

a. Items will be given the degree of protection normally employed by the supplier to afford protection against corrosion, deterioration, and damage during shipment.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

b. Protection will be that used for distribution directly to a using customer or subsequent redistribution as required.

c. Wholesale assembly bulk type practices such as are used in inter- and intraplant shipments or shipments to jobbers are not acceptable, unless they are the usual trade practices for selected commodities; e.g., petroleum, coal and textiles.

3.9 Packaging terminology.

3.9.1 Packaging. The processes and procedures used to protect material from deterioration and damage. It includes cleaning, drying, preserving, packing, marking, and unitization.

3.9.1.1 Preservation. Application of protective measures, including cleaning, drying, preservative materials, barrier materials, cushioning, and containers when necessary.

3.9.1.2 Quantity per unit pack. The quantity of items to be contained in a unit pack shall be given in the terminology of the definitive unit of issue. If a nondefinitive unit of issue is assigned to the stock item, the unit of issue shall be further quantified by a unit of measure and measurement quantity.

3.9.1.3 Unit pack. The first tie, wrap, or container applied to a single item or a quantity thereof, or to a group of items of a single stock number, preserved or unpreserved, which constitutes a complete or identifiable package. The unit pack should be overpacked for shipment unless the unit container is specifically designed to provide shipping protection.

3.9.1.4 Intermediate pack. A wrap, box, or bundle which contains two or more unit packs of identical items.

3.9.1.5 Exterior pack. A container, bundle, or assembly which is sufficient by reason of material, design and construction to protect material during shipment and storage. This can be the unit pack or a container with any combination of unit or intermediate packs.

3.9.1.6 Packing. Assembling of items into a unit, intermediate, or exterior pack with necessary blocking, bracing, cushioning, weather-proofing, reinforcement and marking.

3.9.1.7 Unitization. Any combination of unit, intermediate or exterior packs of one or more line items of supply into a single load in such a manner that the load can be handled as a unit through the distribution system. Unitization (unitized loads-unit loads) encompasses consolidation in a container, placement on a pallet or load base or securely binding together.

3.9.1.8 Marking. Application of numbers, letters, labels, tags, symbols or colors for handling or identification during shipment and storage.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

3.9.2 Containerization. The use of an article of transport equipment designed to facilitate and optimize the carriage of goods by one or more modes of transportation without intermediate handling of the contents.

3.10 Packaging design validation. The establishment of the capability of the prototype pack to protect the integrity and serviceability of the item(s) for which the package is designed.

3.11 Prototype pack. A preproduction pack designed and constructed to meet specified requirements and which is the model for production packaging.

3.12 Repairable item. An item which has been determined by the application of engineering, economic, and other factors to be the type of item feasible of restoration to a serviceable condition through regular repair procedures.

3.13 Repairable-unserviceable item. An item in unserviceable condition which can be restored to serviceable condition economically.

3.14 Reusable containers. A shipping and storage container which is designed for reuse without impairment of its protective function and which can be repaired and-or refitted to prolong its life or to adapt it for shipment of items other than that for which it was originally employed. Reusable shipping and storage containers are further defined in the following paragraphs.

3.14.1 Long life container (100 trips minimum). A shipping container having features such that it can be used repeatedly, and its service life can be expected to equal the service life of the item it is designed to protect. These containers may be refurbished by appropriate maintenance practices and restored to full usage for stockpile.

3.14.2 Short life container (10 trips minimum). A shipping container that can be used for a limited number of times. The container is usually made of wood, plywood, fiberboard or similar material and includes cushioning, die-cuts, inserts, fasteners, etc., which may be described by a drawing and a bill of materials. The container can usually be identified by military or federal specification numbers.

3.14.3 Specialized container. Specialized containers are generally the long-life variety and are uniquely configured to support and protect a specific item, or limited variety of items, during handling, storage, forward and return shipment, unpackaging by the user or to protect personnel and equipment from hazardous contents. Containers of this type frequently incorporate energy absorbing systems, temperature control systems or special features to make handling or shipment possible, easier or safer. Engineering drawings, or equivalent, are used to define form, fit, function, materials, tolerances and manufacturing techniques. Specialized shipping containers, internal fixtures and other fitments result from original design efforts or the redesign or modification of an existing container to meet a specific application or need.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

3.14.4 Multiapplication containers. Multiapplication containers are designed to protect a variety of components within a given fragility and size range. They can be manufactured in a similar manner to that used for specialized containers or in accordance with applicable/specified military or federal specifications. A multiapplication container can be either of the short-life or long-life variety. Short-life multiapplication containers include "fast packs," consisting of a family of standard size cushioned fiberboard shipping containers of four types. These types are fully described in PPP-B-1672 are are identified as Types I, II, III and IV, respectively. Long-life multiapplication reusable containers are designated as Types VI thru VIII in Table I of Appendix G. These containers are made of rugged plastic construction containing internal cushioning pads or permanent shock integration systems (e.g., shear mounts, steel coils, springs, etc.) and are designed to protect repairable components packaged therein, during forward and retrograde movements within the supply system.

3.15 Types of load. Types of loads are determined by the degree of structural strength supplied to the shipping container by the contents. Loads are classified as Type 1, easy loads; Type 2, average loads; and Type 3, difficult loads; as described herein.

3.15.1 Type 1, easy load. A Type 1, easy load, is developed from an item which completely fills the outer shipping container or from items of moderate density prepackaged in an interior container which completely fills the outer shipping container. Easy load items are not easily damaged by puncture or shock and do not shift or otherwise move within the package.

3.15.1.1 Examples of Type 1, easy loads. Items packaged in boxes or cans which are prepackaged in fiberboard boxes prior to overpacking in the shipping container; chests; tool kits and sturdy instruments which are fully in contact with and support, all faces of the shipping container.

3.15.2 Type 2, average load. A Type 2, average load, is developed from item(s) of moderately concentrated weight which are packed directly into the shipping container and provide partial support to all panels thereof. Also item(s) prepackaged by wrapping or by positioning in partitions, cells or paperboard boxes, or by other means which provide support to all panels of the shipping container.

3.15.2.1 Examples of Type 2, average loads. Items packaged in boxes or cans which are not prepackaged in an interior container; bottles individually separated one from the other by cells or partitions.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

3.15.3 Type 3, difficult load. A Type 3, difficult load is developed from item(s) which require a high degree of protection to prevent puncture, shock, or distortion of the shipping container. Also item(s) which do not provide complete support to the panels of the shipping container.

3.15.3.1 Examples of Type 3, difficult load. Wrenches, long bolts, and rods which exert concentrated forces on the shipping container; motors, telephones, typewriters, drop forgings, rivets, hardware, or other items that are random packed in bulk. Fragile or delicate items requiring special protection.

3.16 Modular containers. Modular containers are families of containers designed to be assembled into standard unit loads.

3.17 Container Design Retrieval System (CDRS). A program to provide a DOD centralized, automated data base system for storing, retrieving and analyzing container designs and test information concerning specialized containers. The purpose of the CDRS is to avoid duplication in container designs, minimize the number of new container designs being developed, and promote reuse of existing DOD specialized containers for new item development and procurement. CDRS is governed by MIL-STD-1510.

3.18 Sealed. An item is considered sealed if the entrances to the interior of the item are sealed with gaskets or closely mated surfaces under mechanical pressure, or are sealed by threaded closure devices (except plastic caps). Sealed items also include assemblies which are capsulated in plastics, ceramics, glass, or metal with completely cemented seams or joints closing the interior to the entrance of liquid water. Hermetic sealing is a seal that will exclude air and will be leakproof at normal temperatures and atmospheric pressures.

4. GENERAL REQUIREMENTS

4.1 General. When this Standard is cited for use of contractors who must formulate detailed requirements for approval by the Government, designs, procedures and processes designated by the contractor shall conform to the applicable process specification or Section 5 of the applicable product specification, unless otherwise specified by the acquiring agency. Applicable process specifications are those listed in, but not necessarily limited by, Appendix B of this Standard. In the absence of a process or product specification, Sections 4 and 5 of this Standard shall govern.

4.2 New items and materials.

4.2.1 New items. When there is no process document covering the packaging of newly developed equipment or components, refer to Appendix D to aid in the selection of the method.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

4.2.2 New materials. The use of newly developed packaging materials or products is encouraged and recommended providing they are equal or better than similar approved materials or products without increasing the overall cost to the Government. To expedite their use prior to their inclusion in a Government specification, their use will be permitted under conditions outlined herein. In instances where the material or product is not covered by a specific military specification, the manufacturer or fabricator of the material or product shall furnish documented evidence certified by an approved testing laboratory, that the material or product meets or exceeds all requirements of the performance specification for a similar material or product. The request for approval shall be submitted to the acquiring activity via the technical packaging element of the contract administration activity. If, after a review of the material or product and related certified compliance report, or the witnessing of the stipulated tests, it is the opinion of the approving authority that the material or products meets or exceeds the criteria established for similar material or products, interim authorization for use may be granted pending preparation of a new specification.

4.3 Packaging design drawings. Unless otherwise specified packaging design drawings shall be prepared in accordance with Appendix I of MIL-STD-834 whenever the packaging code of MIL-STD-726 cannot fully describe the details necessary for Government field activities to accomplish the same packaging.

4.4 Reusable containers. The design, development, test and evaluation of shipping containers for major equipment items, and other items which are subject to repair or technical order compliance (TOC) at other than field level shall be governed by the requirements as specified by the acquiring agency.

4.5 Unpacking instructions. In addition to any special marking required by the contract or order, unpacking instructions shall be provided for complex equipment or systems and floating bag type packs. The instructions shall contain information such as the following:

To unpack, remove the top and sides, leaving the unit resting on the bottom of the packing case. Remove the packing bolts that hold the unit on the base of the packing case and slip the unit off the base. In unpacking the item, the following precautions shall be observed to prevent possible damage:

a. Observe the arrows marked on the shipping container. These point to the cover which can be removed most readily.

b. Remove nails with a nail-puller only.

c. Remove screws with a screwdriver only.

d. Never pound or hammer the shipping container.

e. Keep all levers and crowbars away from the interior of the container.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

4.5.1 When practical, a set of these instructions shall be placed in a sealed waterproof envelope prominently marked "UNPACKING INSTRUCTIONS" and firmly affixed to the outside of the shipping container in a protected location (preferably between the cleats on the end of the container adjacent to the identification marking). If the instructions cover a set of equipment packed in multiple containers, the instructions shall be affixed to the number one container of the set or system.

4.5.2 For classified material, if the unpacking instructions contain classified information, they shall be placed inside the shipping or exterior container and instructions for opening the outer container shall be issued by the acquiring activity or departmental regulations.

5. DETAILED REQUIREMENTS

5.1 Preservation.

5.1.1 General considerations. Packaging designs shall be of minimum cost consistent with required performance. Unit and intermediate packs shall be designed to be uniform and standardized and, when applicable, to conserve weight and cube without reducing protection required to insure safe arrival at destination. Fiberboard containers used shall conform to standard size containers listed in Appendix H unless weight and cube will be substantially increased. The preservation methods selected shall ensure protection of contract end items, spare parts, and kits against anticipated natural and induced environments. A prerequisite to selection of preservation and pack design is the analysis of environments to which the item will be subjected during its life cycle. Such analysis shall include, but not be limited to, item characteristics as related to need for protection, induced forces produced in transportation and handling, and climatic environments.

5.1.2 Cleaning and drying. Unless otherwise specified, cleaning and drying shall be in accordance with the applicable procedures of MIL-P-116.

5.1.3 Levels of protection. The levels shall be as specified by the acquiring activity. When levels are not specified, the contractor must provide the appropriate level of protection compatible with the criteria in 3.8. Unless otherwise specified, preservation shall be accomplished in accordance with MIL-P-116. The criteria for determining the methods of preservation are provided in Tables I, Ia, and II of Appendix D of this standard.

5.1.3.1 Level A. When level A is required, it shall conform to the requirements specified in the contract or order. Level A should be used when the most severe conditions are known or anticipated to be encountered during shipment and storage.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

5.1.3.2 Level B. When level B is required, it shall conform to the details specified in the contract or order. The use of level B must be based on firmly established knowledge of the shipment and storage conditions to be encountered and a determination that monetary savings will result.

5.1.3.3 Level C. Unless otherwise specified, items shall be protected in a manner to prevent deterioration and damage during shipment from the supply source to the first receiving activity.

5.1.4 Repairable assemblies. Spare repairable assemblies or components replaceable as a unit shall be packaged individually in reusable or specialized containers when specified.

5.2 Packing.

5.2.1 General considerations. Exterior containers, as far as practicable, shall contain identical quantities, effect a snug fit, and be of uniform dimensional configuration, and where the exterior container is also the unit pack, protection and load conversion requirements of 5.2.1.1 shall apply. With the exception of kits, and whenever practicable, interior packs shall be segregated in the order listed:

a. Items of the same National Stock Number.

b. Items of the same Federal class.

c. Items of the same contract.

d. An identical number of packages of uniform size.

Excluding the above items, but where impractical because of limited quantities to be shipped, items of more than one property class, stock number, cure date, manufacture date or expiration date, may be packed in the same exterior container. All identical items will be segregated in a suitable intermediate container or overwrap. Unit packs, overwraps, and intermediate containers shall be consolidated within exterior shipping containers to the maximum extent, consistent with package size and quantities involved. The exterior shipping containers in these instances shall not exceed 36 inches in height.

5.2.1.1 Protection of the contained item. The container and its suspension or cushioning systems which constitute the unit pack shall protect the item(s) from dynamic environments induced during shipping and handling. When this container is of such type and design that will permit its use as an exterior shipping container, but is inadequate for a Type 3 load, the item(s) packed therein shall be adequately protected with approved cushioning or dunnage media as necessary to convert the load to Type 1 or 2 load, provided there is no adverse

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

effect on the item(s) contained therein. (Overpacking of small, exterior-type shipping containers for consolidation purposes is covered in 5.2.4.) Movement of the item(s) shall be controlled to prevent contact with the container or support structure. In addition, the container shall protect the item(s) from the anticipated transportation and storage environment.

5.2.2 Levels of packing. The level of packing shall be as specified by the acquiring activity.

5.2.2.1 Level A. Exterior containers shall be selected from those listed in Table I as having a level A applicability. When specified, if the containers or dunnage being packed within the exterior container are not water resistant, case liners shall be provided with material conforming to PPP-B-1055 and fabricated in accordance with MIL-L-10547. All joints and seams shall be sealed in accordance with the Appendix of MIL-L-10547. A case liner is not required for weather resistant fiberboard interior containers when all seams and closures are sealed with waterproof tape conforming to PPP-T-60 or PPP-T-76.

5.2.2.2 Level B. Exterior containers shall be selected from those listed in Table I as having level B applicability.

5.2.2.3 Level C. Items or packages that require packing for acceptance by the carrier shall be packed in exterior type shipping containers in a manner that will ensure safe transportation at the lowest rate to the point of delivery, and shall meet, as a minimum, the requirements of the following rules and regulations, as applicable to the mode(s) of transportation to be utilized.

a. Postal regulations.

b. Department of Transportation regulations.

c. Civil air regulations.

d. Uniform freight classification rules.

e. Truckers' Association rules.

f. Other applicable carriers' rules.

g. Military air regulations for dangerous materials.

5.2.2.5 Container closure. Closure and reinforcement (banding) of containers shall be accomplished in accordance with the applicable specification or appendix thereto except that banding for single-wall fiberboard boxes shall be non-metallic or tape only.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

5.2.3 Weight limitations (skids). Shipping containers with a gross weight of 200 pounds or over and those with length and width dimensions of 48 x 24 inches or more weighing more than 100 pounds shall be provided with skids of minimum size nominal 3 x 4 inch lumber laid flat and attached in such a manner as to permit the use of lifting devices and material handling equipment. The skids may be attached crosswise or longitudinally as best suited for the use of material handling equipment, except that where boxes and crates conform to Federal or Military specifications, the skids shall be as specified therein. In addition to specification requirements, 4-way entry shall be provided to material handling equipment on containers 60 inches or more in length or width. Further provisions shall be made to ensure that load-bearing members are provided in areas subject to contact with lifting devices.

5.2.4 Consolidation. Consolidation of containers is permitted utilizing pallets listed in Section XV of Appendix A or appropriate containers listed in Table I. All exterior packs of 1.5 cubic feet or less, having no single dimension (length, width, height) exceeding 40 inches shall be consolidated in containers when the total number of such packs in any individual shipment exceed 25.

5.2.5 Unitized loads. Unitized loads on pallets, box pallets, or other media shall be used to the maximum extent consistent with economy. The contents of each unitized load shall be consigned to a single consignee. Containers or packages shall be unitized by securely anchoring to the unit media with tape, strapping, or shrink film bonding where shrink capability exist. Unitized loads shall be constructed in accordance with MIL-STD-147.

~~5.2.6~~ Excess, residual and repairable-unserviceable material.

5.2.6.1 Excess and residual material. Serviceable or Technical Order Compliance (TOC) excess or residual part(s) which have been removed from the package as received and are to be returned to the Government shall be cleaned and preserved as specified in MIL-P-116 and as determined by this standard. Unless provided by the acquiring activity, the quantity per unit pack (QUP) shall be determined in accordance with Appendix F. Preservation shall be level A and packing level B, unless otherwise specified by the acquiring agency.

5.2.6.2 Repairable excess or residual parts. Repairable-unserviceable excess or residual part(s) for which packaging has not been stipulated by the acquiring activity shall be preserved and packed level C to afford adequate protection as required to prevent further deterioration due to rust, corrosion or physical damage. Unless provided by the acquiring activity, the quantity per unit pack (QUP) shall be one.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE I. Exterior shipping containers - selection by maximum weight of contents and levels of protection.

Specification	Description	Weight of Contents (lbs, max)	Level	Remarks
PPP-B-636	Boxes; fiberboard			
	Weather-resistant	1/	B,C	1/
	Domestic	1/	C	1/
PPP-B-591	Boxes; wood cleated, fiberboard			Weight limitation of specification shall apply to style selection
	Weather-resistant	200	B,C	
	Domestic	400	C	
PPP-B-585	Boxes; wood, wirebound			
	Class 1	500	C	
	Class 2	400	B,C	
	Class 3	300	A,B,C	
MIL-B-43666	Type I - wood cleated	Weight varies with size	A,B,C	Used as insert in cargo transporters such as CONEX, SEAVAN, or MILVAN or as separate exterior shipping containers
	Type II - plywood wirebound		A,B,C	
	Type III - fiberboard		B,C	
MIL-P-26342	Pallet box, fiberboard, expendable, for air shipment			For size and maximum load limitations see MIL-P-26342
	Domestic	800	C	
	Weather-resistant	800	B,C	
PPP-B-601	Boxes; wood, cleated-plywood			Weight limitation of specification shall apply to style selection
	Domestic	1,000 2/	B,C	
	Overseas	1,000	A,B,C	
PPP-B-576	Boxes, wood, cleated, veneer, paper overlaid			
	Class 1	400	C	
	Class 2	350	B, C	

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE I. Exterior shipping containers - selection by maximum weight of contents and levels of protection (continued).

Specification	Description	Weight of Contents (lbs, max)	Level	Remarks
PPP-B-640	Boxes; fiber, corrugated, triple wall	3/		
	Non-weather resistant		C	
	Weather resistant		B,C	
PPP-B-621	Boxes; wood, nailed and lock-corner			May be modified by inclusion of skids
	Overseas	1,000	A,B,C	
	Domestic	600	B,C	
MIL-B-26195	Boxes; wood-cleated, skidded, load bearing base			Size limitation - 16'L
	Domestic	2,500	B,C	
	Overseas	2,500	A,B,C	Only plywood superstructure shall be used for level A
MIL-B-2427	Box, ammunition packing wood, nailed	-	A,B,C	Top opening or end opening, with or without handles
MIL-B-46506	Boxes, ammunition packing wood, wirebound	-	A,B,C	Top opening, with or without handles
PPP-B-1672	Boxes, shipping, reusable with cushioning	-	B,C	For size and weight restrictions, see latest issue of PPP-B-1672
MIL-C-10301	Container; shipping reusable		A,B,C	For transmissions, driving axle, and transfer assemblies weighing up to 1600 pounds
	Type I	200		
	Type II	1,600		
	Type III	1,600		

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE I. Exterior shipping containers - selection by maximum weight of contents and levels of protection (continued).

Specification	Description	Weight of Contents (lbs, max)	Level	Remarks
MIL-C-4150	Cases, Transit and Storage, Waterproof and Watervaporproof	250	A,B,C	Reusable, heavy duty, size as specified
MIL-C-11133	Crate; wood, open, wirebound			Slatted-style
	Grade A (overseas)	1,000	A,B,C	
	Grade B (domestic)	1,000	B,C	
MIL-C-9897	Crates; slotted angle, steel or aluminum	3,000	A,B,C	For lightweight airframes or bulky items; open or sheathed, with or without skids
MIL-C-52950	Crates; wood, open and covered	4,000	A,B,C	For size and weight restrictions, see latest issue of MIL-C-52950
MIL-C-22806	Crates; sheathed, wood, wirebound	5,000	A,B,C	For overseas and domestic use; for heavier loads see 6.1.1 of MIL-C-22806
MIL-C-3774	Crates; wood, open		A,B,C	Bolted or nailed assembly; size limitations: Type I 16' x 8' x 8' Type II 40' x 8' x 16'
	Type I	12,000		
	Type II	16,000		
MIL-C-104	Crates; wood, lumber and plywood sheathed, nailed and bolted	30,000	A,B,C	Size limitation 30'L x 9'W x 10'H (unless otherwise specified)
MIL-C-25731	Crates; wood, for domestic and overseas shipment of airframe components	2,000	A,B,C	Open and sheathed; non-, semi-, and fully demountable; see MIL-C-25731 for size limitations

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE I. Exterior shipping containers - selection by maximum weight of contents and levels of protection (continued).

Specification	Description	Weight of Contents (lbs, max)	Level	Remarks
MIL-C-11264	Crates; wood, reusable	-	A,B	For vehicular assemblies weighing over 1600 pounds
PPP-D-711	Drum; metal, steel	-	A,B,C	Shipment of non-corrosive material; 55 gal capacity
PPP-D-723	Drum; fiber	550	B,C	Domestic normal and military overseas shipment
DOT 22A, DOT 22B, and DOT 22C	Drum; plywood	-	A,B,C	Title 49 CFR
PPP-D-732	Drums; metal, 55 gallon, reconditioned (for shipment of non-corrosive material)	-	A,B,C	Shipment of non-corrosive material
MIL-D-6054	Drum; metal	-	A,B,C	MS27684, MS27683; exterior use; 3 to 80 gal capacity
ASO Dwg. P069	Container, Molded, Reusable	4	A,B,C	For circuit boards and modules
ASO Dwg. 13414	Container, Modular Reusable	120	A,B,C	For major repairables
ASO Dwg. 15024	Container, Shipping and Storage	40	A,B,C	For gyroscopic instruments

1/ Size and weight limitations (see appropriate tables in PPP-B-636).

2/ Greater weights of contents may be permitted. See 6.1.2 of PPP-B-601.

3/ Maximum weight not specified; selection of style, supporting pallets or skids should be governed by anticipated load. Boxes are to be used when loads exceed limits of PPP-B-636 boxes.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

5.2.7 Wheeled items. Rubber tired wheels, pneumatic or solid shall be blocked clear of the floor of the crate or of the skid and shall not be load bearing. When specified, wheeled items shall be shipped uncrated as mobile packs.

5.3 Specific considerations.

5.3.1 Rubber and synthetic rubber items. When rubber or synthetic rubber items are unit packed in quantities of more than one, the individual pieces shall be dusted with technical talcum (soapstone), conforming to commercial standard, in powder form, or shall be separated by kraft paper or plastic film separators and shall be further protected to prevent permanent deformation or set.

5.3.2 Items with grease fittings. Items such as universal joints and flexible cables that are equipped with grease fittings or tapped holes for such fittings shall be preserved with grease specified for normal operation.

5.3.3 Packaging gaskets or seals. When gaskets or seals are used in connection with the preservation procedure and could be mistakenly used in the installation of the item, they must be identified in a manner that will prevent their accidental use in the installation of the assembly.

5.3.4 Cushioning Cushioning shall be provided by shock and vibration-absorbing materials or devices that adequately protect the contents from physical damage during handling, shipment, and storage. The cushioning medium shall be placed with relation to other parts of the pack, as close to the contents as practicable; however, a non-corrosive wrap shall be placed between the item and all corrosive type cushioning media.

5.3.4.1 Equipment mounts. Equipment designed to be used on vibration-shock mounts suitable for use in airborne and ground equipment shall not be shipped on the provided equipment mounts, unless the mounts are made inactive or unless the mounts are an integral internal part of the equipment. In either event a suitable cushioning system shall be provided.

5.3.4.2 Determination of item fragility. Fragility factors in the non-operating state established in item specifications shall be used as a guide to establish the maximum energy which will be permitted to reach the item during transportation and handling. It shall be necessary to provide a means of damping induced energy to or below the specification limits. Caution shall be taken to ensure that there are no additional components installed which lower the item fragility rating.

5.3.4.3 Energy damping methods and package cushioning design. Establishment and design of the energy damping methods and package cushioning media shall be in accordance with MIL-HDBK-304.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

5.3.5 Stiffeners. When stiffeners are required the unit pack quantity shall be sandwiched between two pieces, inserted within one folded piece, or taped or tied to a single piece of material 1/2 inch larger in length and width than the item or unit quantity. Stiffener material shall conform to UU-C-282 or PPP-F-320. After positioning the item between stiffeners, the stiffeners shall be secured to each other with tape to prevent movement that may exert pressure on items subject to set and distortion.

5.3.6 Electronic devices susceptible to damage by environmental field forces. Sensitive electronic devices (including modules, circuit card assemblies and printed wiring boards containing one or more of these sensitive components) shall be packaged in accordance with the applicable submethod of Method IA (for level A or B) or Method IC (for level C or industrial) of MIL-P-116. When required to protect the device or barrier, only non-corrosive electrostatic-protective wrapping or cushioning shall be used. Wrapping material shall conform to type II of MIL-B-81705. Cushioning material shall conform to PPP-C-1842, type III or MIL-P-81997, type II Each device, wrapped or cushioned as required, shall be inserted in heat sealed bags or envelopes conforming to MIL-B-117, type I, class F, style 1 (for electromagnetic, electrostatic, and watervaporproof protection) or in heat sealed bags conforming to MIL-B-117, type I, class A, style 2 or MIL-P-81997 (when only electrostatic and waterproof protection is necessary). Larger bags shall be fabricated from MIL-B-81705, type I material for electromagnetic, electrostatic, and watervaporproof protection and from MIL-B-81705, type II material for electrostatic and waterproof protection. The sensitive electronic device symbol and associated caution label shall be employed as specified in MIL-STD-129 on all unit, intermediate and exterior containers enclosing these devices. To assure protection in handling, sensitive devices shall be opened only at field force protective work stations. The requirements of this paragraph apply to all levels of protection.

5.3.7 Items with complex surfaces. Items requiring internal preservation shall be slushed, sprayed, or dipped, as applicable, with the preservative oil or compound. Preservative shall be applied in such a manner to insure complete coverage of internal and, if required external surfaces. The preservative shall be thoroughly drained to avoid possible entrapment of preservative that could subsequently damage the pack. In addition, all threaded openings shall be sealed with caps or plugs conforming to MIL-C-5501 except that all internally threaded openings for fluid systems components shall use metal closures in accordance with MIL-C-5501. Other openings shall be sealed with caps, covers, or wrapped with MIL-B-121 barrier material and secured with PPP-T-60 tape.

5.3.8 Disassembly. When specified, items shall be disassembled into component parts provided an overall saving will result and disassembly and reassembly can be accomplished with the use of common hand tools by semi-skilled personnel.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

5.3.8.1 Attaching parts. When attaching parts, such as nuts, bolts, washers, etc., accompany the basic item, they shall be preserved, bagged, or otherwise secured, appropriately identified, and attached to, or adjacent to, the intended fitting.

5.3.8.2 Matchmarking. Disassembled parts which are not interchangeable shall be matchmarked to facilitate reassembly. Matchmarking shall be accomplished by means of tags conforming to Type A, Size 1 of UU-T-81, with suitable identification printed thereon and with tags and printing waterproofed. Tags shall be securely attached to the removed parts and mating parts on the basic unit in such a manner that no damage occurs to the item nor the preservation thereof.

5.3.9 Caging. Items such as instruments, gyroscopes, etc. which incorporate caging or damping features for securing movable parts in place shall be properly engaged or electrically dampened prior to packaging.

5.4 Unit container.

5.4.1 Use of unit containers. Specific use of containers shall be as outlined in MIL-P-116.

5.4.2 Unit container size. Flexible and rigid containers shall be of a size to provide a snug fit for the wrapped and cushioned item (see Table II). The sequence of length, width, and depth for ordering purposes shall be in accordance with the applicable container specification.

5.4.3 Intermediate containers and quantities. Unless otherwise specified, multiple quantities of boxed, bagged or wrapped items shall be packed within intermediate containers. Bags shall not be used as intermediate containers. A maximum of 100 unit packs is permitted in one intermediate container. Intermediate containers shall not exceed a maximum of 40 pounds net weight, and a maximum of 1.5 cubic feet, with at least each of two dimensions not exceeding 16 inches. Intermediate containers shall not be required when the total quantity being shipped will result in only one intermediate container per shipping container.

5.4.4 Exterior containers. Containers shall conform to the applicable specifications listed in Table I. When the unit container is to serve as the shipping container it must meet the specified requirements for both the levels of preservation and packing. The use of containers which are not listed, but which meet or exceed the requirements of listed containers may be used, provided the containers have been approved as indicated herein. The container shall be of a minimum weight and cube consistent with the requirements of the specification.

5.5 Lumber and plywood.

5.5.1 Lumber. Lumber used for container construction and interior blocking and bracing shall conform to the requirements of MIL-STD-731.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE II. Interior containers - selection by weight of contents and size of container.

Specification	Description	Size Limits 1/	Weight of Contents (Max)	Remarks
MIL-B-117 3/	Bags, Sleeves and Tubing, Interior packaging Type I Type II Type III Class B Class C Class E Style 1 Style 2 Style 3	Size of bags are unrestricted with the following exception: Type II, Class E, Style 1 and Type II, Class E, Style 3. Total inside dimensions, computed by adding the width and length of one flat side, shall not exceed 42 inches.	Net weight of contents shall not exceed 10 pounds except that there are no weight restrictions for the following bags: Type I Class B Style 2; Type I Class C Style 2; and Type I Class E, Styles 1, 2 and 3.	 Heavy duty Medium duty Light duty Waterproof Waterproof, Greaseproof Greaseproof, Waterproof, Water Vapor-proof Opaque Transparent One side opaque, other side transparent
MIL-B-22020 3/	Bags; VCI treated, transparent, heat sealable	-	5	Storage (36 months) and shipboard use
PPP-B-566	Boxes; folding, paperboard	750 cu. in.	10	11 styles
PPP-B-676	Boxes, set-up paperboard	-	10	4 types, 5 classes, 4 styles
PPP-B-636	Box, fiberboard Weather-resistant	2/	2/	Weight limitation by Mullen Test selection shall apply to maximum load specified herein.
	Domestic	2/	2/	
PPP-B-665	Boxes; metal stayed, paperboard	2000 cu. in.	40	5 styles
MIL-C-3955	Can, spirally wound, fiber	7-1/8 in. dia. x 60 in. long	20	Items requiring physical, waterproof or moisture-proof protection
MIL-D-6055	Drum, metal with removable head	88 to 510 cu. in.	8	Reusable drum - MS24347
MIL-E-6060	Envelopes; water vapor-proof, flexible	-	-	For floating bag application and packages containing inspection windows

1/ For boxes, figure denotes internal volume or sum of length, width, and height.
For bags, figure denotes total inside dimensions computed by adding the width and length of one flat side.
For cylinders, figure denotes internal volume.
2/ See appropriate tables in PPP-B-636.
3/ The use of comparable transparent and opaque material in the same bag will be permitted, i.e., transparent sheet heat-sealed to opaque sheet.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

5.5.2 Plywood. Plywood used for container construction and interior blocking and bracing shall conform to the requirements of NN-P-530.

5.6 Kits. Kit components shall be processed as specified in Appendix E.

5.7 Marking. All unit and intermediate packs, and shipping containers shall be marked in accordance with MIL-STD-129 and additional marking requirements as specified by the acquiring activity.

5.7.1 Service bulletins and changes. (Not applicable for Air Force.) All shipping containers shall be so identified that it will be unmistakably clear to the recipient, without opening the container, which service bulletins and changes relative to content have been incorporated prior to shipment. Normally the new or revised part number satisfies this requirement. In the event that this is not clear by change of part number, or by using the latest change letter suffix to the part number (where such suffix number is keyed to the pertinent service bulletin or change), the following marking shall be applied.

a. Cognizant Command or Service change (insert number) incorporated.

b. Command or Service bulletin (insert number) incorporated.

c. (Contractor's designation) engineering change (or design change) incorporated.

d. (Contractor's designation) Service bulletin (insert number) incorporated.

5.8 Hazardous material shipment.

5.8.1 By military air (including Logair and Quicktrans). Hazardous materials required to be shipped by military air or delivered to an airport of embarkation for shipment by military air shall be prepared for shipment according to provisions of AFR 71-4, DLAM 4145.3, TM 38-250, NAVSUP Pub 505, MCO P4030.19, Preparation of Hazardous Material for Military Air Shipment.

5.8.2 Other than by military air. Hazardous materials required to be shipped by a mode of transportation other than military air shall be prepared for shipment in accordance with Title 49 CFR Parts 100-178. Shipments by parcel post must comply with postal regulations (USPS Publication 52).

5.9 Packaging design validation. Unless otherwise specified the contractor shall perform packaging design validation tests prescribed in 10.3 of Appendix C when:

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

a. Level A or B preservation and packing or combination thereof is specified and

b. The unit container is the shipping container and none of the following conditions exist:

1. Level C preservation or packing is specified, or

2. Detailed packaging instructions (e.g., TPO, SPI, MIL-STD-726 Code, or Specification) or design are furnished by the acquiring activity, or

3. The Government or the contractor has data or other evidence to indicate that the proposed packaging design will successfully meet the requirements of the contract, or

4. Item meets the weight, dimension, and fragility requirements of Table I of Appendix G and multi-application containers are used.

5.10 Packaging data forms. When required by the contract, the contractor shall prepare preservation and packaging data in accordance with MIL-STD-834 and deliver it as specified on the contract DD Forms 1423.

5.11 Security assistance material. In general, all international logistics (Grant Aid and Foreign Military Sales) material will be properly preserved and packed or otherwise prepared for shipment to afford the level of protection necessary to insure safe arrival at destination and adequate protection for a period of subsequent storage within the recipient country. Unless otherwise specified, defense articles will be preserved to level A requirements and packed to not less than level B requirements of this standard. For Foreign Military Sales purposes single packages will not contain items applicable to more than one sales case.

6. NOTES

6.1 Contractual requirements. Contract documents shall specify the following:

a. Title, number, revision and date of this standard.

b. Levels of preservation and packing required (see 3.8).

c. If case liners are required (see 5.2.2.1).

d. If wheeled items shall be shipped uncrated as mobile packs (see 5.2.7).

e. If tipover test is required (see 10.5.1.1.2 of Appendix C).

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

Custodians:
Army - SM
Navy - AS
Air Force - 43
DLA - ES

Preparing activity:
Navy - AS
(Project No. PACK-0692)

Review activities:
Army - AV, EA
Navy - OS, SA, EC, YD
Air Force - 10, 11, 13, 18, 19, 69, 99
DLA - IS

User activities:
Army - MI
Navy - SH, MC

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

APPENDIX A

MATERIAL AND CONTAINER DOCUMENTS

10. Scope.

10.1 This appendix includes material and container documents which would normally be listed in Section 2 of this standard. Because of the voluminous listings, it has been considered more practical to place them in this appendix.

10.2 This appendix also lists documents not referenced in this standard, but are included here as an aid to users of this standard. When used, the issues of the following material and container documents in effect on the date of invitation for bids or request for proposal, form a part of this standard to the extent specified herein.

20. Material and container documents are listed by categories, as follows:

SECTION	
I	Adhesives
II	Bags, Sacks, and Envelopes
III	Barrels, Drums, Pails, and Kegs
IV	Barrier Materials
V	Cleaning Agents
VI	Cleaning Materials
VII	Coatings, Compounds, Oil and Preservatives
VIII	Containers (Rigid Form), Exterior
IX	Containers (Rigid Form), Interior
X	Cushioning Materials
XI	Desiccants, Corrosion Inhibitors and Humidity Indicators
XII	Lumber and Plywood
XIII	Marking and Marking Equipment
XIV	Packaging Hardware
XV	Pallets and Skids
XVI	Protectors, Closures, and Plugs
XVII	Sealing Equipment
XVIII	Strapping and Strapping Equipment
XIX	Tapes
XX	Windows

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

SECTION I. ADHESIVES

MMM-A-122	Adhesive, Butadiene Acrylonitrile Base, Medium Solids, General Purpose
MMM-A-125	Adhesive, Casein-type, Water and Mold Resistant
MMM-A-178	Adhesive, Paper Label, Water Resistant
MMM-A-179	Adhesive, Paper Label, Water Resistant, Water Emulsion Type
MMM-A-187	Adhesive, Epoxy Resin Base Low and Intermediate Strength
MMM-A-188	Adhesive, Urea-Resin-Type (Liquid and Powder)
MMM-A-250	Adhesive, Water-Resistant (For Sealing Fiberboard Boxes)
MMM-A-260	Adhesive, Water-Resistant (For Sealing Waterproof Paper)
MMM-A-1617	Adhesive, Rubber Base, General Purpose
MIL-A-3167	Adhesives (For Plastic Inhibitors)
MIL-HDBK-691	Adhesives

SECTION II. BAGS, SACKS, AND ENVELOPES

UU-B-36	Bags, Paper, Grocers
UU-S-48	Sacks, Shipping, Paper
PPP-B-15	Bag and Envelope, Cellophane, for Packaging
PPP-B-20	Bags, Cotton, Mailing
PPP-B-26	Bag, Plastic (General Purpose)
PPP-B-35	Bags, Textile, Shipping, Burlap, Cotton and Waterproof Laminated
PPP-E-540	Envelopes, Water Resistant, for Packing List and Shipping Documents
PPP-E-1533	Envelopes, Packaging, Cushioned

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

SECTION II. (Continued)

PPP-P-700	Protector, Packing List
PPP-S-30	Sacks, Shipping, Paper (Cushioned)
MIL-B-117	Bag, Sleeve and Tubing, Interior Packaging
MIL-E-6060	Envelope, Packaging, Water Vaporproof, Flexible
MIL-B-22020	Bag, Transparent, Flexible, Sealable, Volatile Corrosion Inhibitor
MIL-B-40028	Bags, Barrier, With Volatile Corrosion Inhibitor Treated Liners
MIL-B-43444	Bag, Plastic, Contaminated Waste Disposal

SECTION III. BARRELS, DRUMS, PAILS, AND KEGS

PPP-D-705	Drum, Metal, Shipping, Steel (16 and 30 Gallon Capacity)
PPP-D-711	Drums, Metal, Shipping, Steel, Lightweight (55 Gallon)
PPP-D-723	Drums, Fiber
PPP-D-729	Drums, Metal, Shipping and Storage, Steel, 55 Gallon
PPP-D-732	Drums, Metal, 55 Gallon, Reconditioned (For Shipment of Noncorrosive Materials)
PPP-D-736	Drums, Shipping, Steel DOT-6A, DOT-6B and DOT-17C
PPP-D-1152	Drum, Steel, 55 Gallon (21 and 24 Gage Reinforced)
PPP-P-704	Pail, Shipping, Steel (1 through 12 Gallons)
MIL-D-195	Drums, Steel, Calcium Carbide (100-Pound Capacity)
MIL-D-6054	Drum, Metal-Shipping and Storage
MIL-D-6055	Drum, Metal, Reusable, Shipping and Storage (Cap. from 88 to 510 Cubic Inches)
MIL-C-13984	Cans, Water, Military, 5 Gallon
MIL-D-23119	Drum, Fabric, Collapsible, Liquid Fuel, Cylindrical, 500 Gallon Capacity
MIL-D-40030	Drum, Plastic, Molded Polyethylene

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

SECTION IV. BARRIER MATERIALS

L-C-110	Cellophane (Coated and Non-Coated Regenerated Cellulose Film)
L-P-378	Plastic Sheet and Strip, Thin Gage, Polyolefin
QQ-A-1876	Aluminum Foil
PPP-B-1055	Barrier Material, Waterproof, Flexible
MIL-B-121	Barrier Material, Greaseproofed, Waterproofed, Flexible
MIL-B-131	Barrier Material, Water-Vaporproof, Flexible, Heat-Sealable
MIL-L-10547	Liners, Case, and Sheet, Overwrap, Water-Vaporproof or Waterproof, Flexible
MIL-P-20293	Paper, Kraft, Asphalt Impregnated
MIL-B-22019	Barrier Material, Transparent, Flexible, Sealable, Volatile Corrosion Inhibitor Treated
MIL-B-22191	Barrier Material, Transparent, Flexible, Heat Sealable
MIL-P-81598	Plastic Sheets, Flexible, Weather Resistant, Heat Sealable, for Outdoor Storage Use
MIL-B-81705	Barrier Materials, Flexible, Electrostatic-Free, Heat Sealable
MIL-P-81997	Pouches, Cushioned, Flexible, Electrostatic-Free, Reclosable, Transparent

SECTION V. CLEANING AGENTS

O-E-760	Ethyl Alcohol (Ethanol); Denatured Alcohol and Proprietary Solvent
O-T-236	Tetrachloroethylene (Perchloroethylene), Technical Grade
O-T-634	Trichloroethylene, Technical
P-C-436	Cleaning Compound, Alkali, Boiling Vat (Soak) or Hydro Steam
P-C-437	Cleaning Compound, High Pressure (Steam) Cleaner
P-C-444	Cleaning Compound, Solvent Soluble, Grease Emulsifying

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

SECTION V. (Continued)

P-C-535	Cleaning Compound, Platers' Electro Cleaning, for Steel
P-D-680	Dry-Cleaning Solvent
TT-M-261	Methyl-Ethyl-Ketone, Technical
TT-N-95	Naphtha, Aliphatic
MIL-C-372	Cleaning Compound, Solvent (For Bore of Small Arms and Automatic Aircraft Weapons)
MIL-S-10561	Solvent, Cleaning, High Temperature Pressure Spray
MIL-C-10597	Cleaning Compound, With Conditioner and Inhibitor for Engine Cooling Systems
MIL-C-11090	Cleaning Compound, Degreasing and Depreserving Solvent, Self-Emulsifying
MIL-H-13528	Hydrochloric Acid, Inhibited, Rust-Removing
MIL-C-14460	Corrosion Removing Compound, Sodium Hydroxide Base, for Electrolytic or Immersion Application
MIL-D-16791	Detergent, General Purpose (Liquid, Nonionic)
MIL-C-81302	Cleaning Compound, Solvent, Trichlorotrifluoroethane

SECTION VI. CLEANING MATERIALS

CCC-C-46	Cloth, Cleaning, Nonwoven Fabric
CCC-C-429	Cloth, Osnaburg, Cotton
CCC-C-440	Cloth, Cheesecloth, Cotton, Bleached and Unbleached
CCC-C-467	Cloth, Burlap, Jute (or Kenal)
DDD-C-301	Cheesecloth, (For) Wiping Purposes, Remnants and Seconds
DDD- 441	Cloths, Polishing

SECTION VII. COATINGS, COMPOUNDS, OILS, AND PRESERVATIVES

O-L-164	Leather Dressing, Mildew Preventive
TT-C-495	Coating, Exterior, for Tinned Food Cans

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

SECTION VII. (Continued)

TT-C-598	Caulking Compound, Oil and Resin Base Type (For Masonry and Other Structures)
TT-P-664	Primer Coating, Synthetic, Rust-Inhibiting, Lacquer Resisting
VV-S-190	Sealing Compound (Dipcoating)
VV-L-800	Lubricating Oil, General Purpose Preservative, (Water Displacing, Low Temperature)
MIL-P-149	Plastic Coating Compound, Strippable, (Hot-Dipping)
MIL-C-450	Coating Compound, Bituminous Solvent Type, Black (For Ammunition)
MIL-R-3043	Resin Coating, Unpigmented (For Engine Components and Metal Parts)
MIL-L-3150	Lubricating Oil, Preservative, Medium
MIL-C-3254	Coating System, Bridging, Strippable, Sprayable
MIL-P-3420	Packaging Materials, Volatile Corrosion Inhibitor Treated, Opaque
MIL-W-3688	Wax Emulsion (Rust Inhibiting)
MIL-C-4339	Corrosion Preventive, Soluble Oil, for Water Injection Systems
MIL-C-5545	Corrosion Preventive, Aircraft Engine, Heavy Oil Type
MIL-L-6081	Lubricating Oil, Jet Engine
MIL-L-6082	Lubricating Oil, Aircraft Reciprocating Engine (Piston)
MIL-H-6083	Hydraulic Fluid, Petroleum Base, for Preservation and Operation
MIL-L-6085	Lubricating Oil, Aircraft Instrument, Low Volatility
MIL-C-6529	Corrosion Preventive, Aircraft Engine
MIL-C-6799	Coating, Sprayable, Strippable, Protective, Water-Emulsion

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

SECTION VII. (Continued)

MIL-L-7808	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base
MIL-L-7870	Lubricating Oil, General Purpose, Low Temperature
MIL-C-8188	Corrosion-Preventive Oil, Gas Turbine Engine, Aircraft, Synthetic Base
MIL-C-10382	Corrosion Preventive, Petrolatum, Spraying Application, for Food Handling Machinery and Equipment
MIL-C-10578	Corrosion Removing and Metal Conditioning Compound (Phosphoric Acid Base)
MIL-G-10924	Grease, Automotive and Artillery
MIL-P-11520	Preservative Coating, Rubber, for Rubber Surface
MIL-C-11796	Corrosion Preventive, Petrolatum, Hot Application
MIL-C-15074	Corrosion Preventive, Fingerprint Remover
MIL-C-16173	Corrosion Preventive Compound, Solvent Cut Back, Cold Applications
MIL-C-16555	Coating Compound, Strippable, Sprayable
MIL-L-21260	Lubricating Oil, Internal Combustion Engine, Preservation and Break In
MIL-C-22750	Coating, Epoxy-Polyamide
MIL-C-23760	Coating, Sprayable, Strippable, Protection for Preservation and Packaging of Weapon Systems and Components, Application of
MIL-G-23827	Grease, Aircraft and Instrument, Gear and Actuator Screw
MIL-C-27725	Coating, Corrosion Preventive, for Aircraft Integral Fuel Tanks
MIL-P-45021	Plastic Coating Compound, Strippable, Cold Dipping 120°F (49°C)
MIL-C-83933	Corrosion Preventive Compound Cold Application (For Motor Vehicles)

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

SECTION VIII. CONTAINERS (RIGID FORM), EXTERIOR

PPP-B-576	Boxes, Wood, Cleated, Veneer, Paper Overlaid
PPP-B-580	Box, Household Goods
PPP-B-585	Boxes, Wood Wirebound
PPP-B-587	Boxes, Wood, Wirebound, Pallet Type
PPP-B-591	Box, Fiberboard, Wood-Cleated
PPP-B-601	Box, Wood, Cleated-Plywood
PPP-B-621	Box, Wood, Nailed and Lock Corner
PPP-B-636	Box, Shipping, Fiberboard
PPP-B-640	Box, Fiberboard, Corrugated, Triple Wall
PPP-B-1163	Box, Corrugated Fiberboard, High Compression Strength, Weather Resistant, Wax Resin Impregnated
PPP-B-1364	Box, Corrugated Fiberboard, High Strength, Weather Resistant, Double-Wall
PPP-B-1672	Box, Shipping, Reusable With Cushioning
PPP-C-186	Containers, Packaging and Packing for Drugs, Chemicals and Pharmaceuticals
PPP-C-1266	Container, Thermal, Shipping, for Medical Material Requiring Controlled Temperature Ranges
PPP-T-495	Tubes, Mailing and Filing
MIL-C-104	Crates, Wood, Lumber and Plywood Sheathed, Nailed and Bolted
MIL-B-2427	Boxes, Ammunition Packing, Wood, Nailed
MIL-C-3774	Crates, Wood, Open 12,000 and 16,000 Lb. Capacity
MIL-C-4150	Cases, Transit and Storage, Waterproof and Water Vaporproof
MIL-C-4710	Case Set, Transport and Storage

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

SECTION VIII. (Continued)

MIL-C-5584	Containers, Shipping, Metal, Reusable
MIL-C-5806	Box, Shipping and Storage Helicopter Blade
MIL-C-9361	Container, Reusable, Shipping and Storage, Disassembled, Nested, External, Aircraft Fuel Tanks
MIL-C-9897	Crate, Slotted Angle, Steel or Aluminum, for Lightweight Airframe Components and Bulky Items (For Maximum Loads of 3000 Pounds)
MIL-C-9959	Container, Flexible, Reusable, Waterproof, Water Vaporproof
MIL-C-10301	Containers, Shipping, Reusable, (Boxes, Crates) for Transmission or Transfer Assemblies of Tank and Automotive Vehicles
MIL-C-11133	Crates, Open, Wirebound
MIL-C-11264	Crates, Wood, Vehicular Assemblies, Reusable Shipping Container for Tank-Automotive Engines,Transmissions, Differentials, Transfers, Final Drives, and Similar Assemblies
MIL-B-11886	Boxes, Metal, Shipping, Reusable, Transporter, Steel, Maximum Load 9000 Pounds
MIL-C-14200	Containers, Shipping and Storage, Metal, Reusable, for Engines, Transmission, Differentials, Transfers, and Similar Assemblies
MIL-B-17757	Boxes, Shipping, Fiberboard (Modular Sizes)
MIL-C-22806	Crates, Sheathed, Wood, Wirebound
MIL-C-25731	Crates, Wood, for Domestic and Overseas Shipment of Airframe Components (2000 Lbs. Maximum Net Load)
MIL-B-26195	Boxes, Wood, Cleated, Skidded, Load Bearing Base
MIL-C-38226	Containers, Polyurethane, Rigid or Elastic for Packaging Small Engines
MIL-B-38721	Boxes, Consolidation, Fiberboard
MIL-C-38770	Container, Shipping and Storage, Steel, Lightweight Reusable, General Specification for

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

SECTION VIII. (Continued)

MIL-B-43273	Box, Fiberboard, for Packaging and Packing Personnel Parachutes and Canopy Assemblies
MIL-B-43666	Boxes, Shipping Consolidation
MIL-B-52508	Boxes, Metal, Shipping, Reusable, Transporter, Controlled Humidity, Steel, 270 Cubic Feet, 9000 Pound Maximum Load
MIL-C-52661	Container, Cargo
MIL-C-52950	Crate, Wood, Open and Covered

SECTION IX. CONTAINERS (RIGID FORM) INTERIOR

PPP-B-566	Boxes, Folding, Paperboard
PPP-B-636	Boxes, Shipping, Fiberboard
PPP-B-650	Box, Fiberboard, Special Purpose (Records Retiring)
PPP-B-665	Boxes, Paperboard, Metal Edged and Components
PPP-B-676	Boxes, Set-Up
PPP-C-55	Cans, Composite (For Dry Products)
PPP-C-96	Cans, Metal, 28 Gage and Lighter
MIL-C-3955	Cans, Fiber, Spirally Wound
MIL-C-26094	Cans, Hermetic Sealing, Aluminum, Two Piece
MIL-B-26701	Bottles, Screw Cap and Carboys, Polyethylene Plastic

SECTION X. CUSHIONING MATERIALS

C-F-202	Felt Sheet (Hair) and Felt Roll (Hair)
C-F-206	Felt Sheet, Cloth, Felt, Wool, Pressed
UU-C-201	Cardboard and Railroad Board (Manila and Wood)
UU-C-282	Chipboard
PPP-C-795	Cushioning Material, Flexible, Cellular, Plastic Film for Packaging Applications
PPP-C-843	Cushioning Material, Cellulosic

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

SECTION X. (Continued)

PPP-C-850	Cushioning Material, Polystyrene, Expanded, Resilient (For Packaging Uses)
PPP-C-1120	Cushioning Material, Uncompressed Bound Fiber, for Packaging
PPP-C-1683	Cushioning Material, Expanded Polystyrene, Loose Fill Bulk (For Packaging Application)
PPP-C-1752	Cushioning Material, Packaging, Unicellular Polyethylene Foam, Flexible
PPP-C-1797	Cushioning Material, Resilient, Low Density, Unicellular, Polypropylene Foam
PPP-C-1842	Cushioning Material, Plastic, Open Cell (For Packaging Application)
PPP-E-911	Excelsior, Wood, Fabricated Pads and Bulk Form
PPP-F-320	Fiberboard, Corrugated and Solid, Sheet Stock (Container Grade) and Cut Shapes
PPP-P-115	Pads, Paper, Macerated
PPP-P-291	Paperboard, Wrapping and Cushioning
MIL-F-2312	Felt, Hair or Wool, Mildew Resistant
MIL-B-3106	Board, Composition, Water Resistant Solid (For Filler or Cushioning Pads)
MIL-C-3133	Cellular Elastomeric Materials, Molded or Fabricated Parts
MIL-R-5001	Rubber Cellular Sheet, Molded and Hand Built Shapes: Latex Foam
MIL-R-6130	Rubber, Cellular, Chemically Blown
MIL-H-9884	Honeycomb Material, Cushioning Paper
MIL-P-13607	Padding Materials, Resilient (For Packaging of Ammunition)
MIL-F-17057	Felt Sheet, Wool, Compound Impregnated, Chock Padding
MIL-P-19644	Plastic Molding Material (Polystyrene Foam, Expanded Bead)
MIL-R-20092	Rubber Sheets and Molded Shapes Cellular, Synthetic, Open Cell (Foamed Latex)

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

SECTION X. (Continued)

MIL-P-26514	Polyurethane Foam, Rigid or Elastic, for Packaging
MIL-C-26861	Cushioning Material, Resilient Type, General
MIL-F-26862	Fiberboard, Solid, Noncorrosive, Fungi-Resistant for Interior Blocking Applications

SECTION XI. DESICCANTS, CORROSION INHIBITORS, AND HUMIDITY INDICATORS

O-I-490	Inhibitor, Corrosion, Liquid Cooling System
MIL-D-3263	Desiccant Containers, Dehumidifier
MIL-D-3464	Desiccants (Activated) Bagged, Packaging Use and Static Dehumidification
MIL-D-3716	Desiccants (Activated) (For Dynamic Dehumidification)
MIL-P-6131	Plugs, Dehydrator, Humidity Indicating
MIL-I-8835	Indicator, Humidity, Card, Chemically Impregnated
MIL-I-22110	Inhibitors, Corrosion, Volatile, Crystalline
MIL-I-23310	Inhibitors, Corrosion, Volatile, Oil Type
MIL-I-26860	Indicator, Humidity, Plug, Color Change
MS20003	Indicator, Humidity, Card, Three Spot Impregnated Area
MS16188	Chart, Humidity Indicator Color Comparison

SECTION XII. LUMBER AND PLYWOOD

MM-L-751	Lumber, Softwood
NN-P-530	Plywood, Flat Panel
PPP-V-205	Veneer, Paper Overlaid, Container Grade
MIL-P-9902	Panels, Full-Cleated, Partially Cleated and Uncleated, Plywood, Veneer, Paper Overlaid and Solid Fiberboard For Box, Modular Systems
MIL-STD-731	Quality of Wood Members For Containers and Pallets

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

SECTION XIII. MARKING AND MARKING EQUIPMENT

H-B-621	Brush, Stencil
GG-S-747	Stencil Cutting Machine, Hand Operated
GG-S-749	Stencil Cutting Machine, Electric
TT-P-98	Paint, Stencil, Flat
UU-L-49	Labels, Paper, Gummed (Water Activated)
UU-S-625	Stencilboard
UU-T-81	Tags, Shipping and Stock
MIL-P-52108	Paint, Water Emulsion Type (For Stenciling and Obliterating)
MIL-STD-129	Marking for Shipment and Storage
MIL-STD-130	Identification Marking of U.S. Military Property
MIL-STD-190	Identification Marking of Rubber Products
MS16110	Label, Volatile Corrosion Inhibitor
MS27402	Label, Tape, Pressure Sensitive Adhesive (Hi-Valu)
MS27412 through MS27416	Label, Tape, Pressure Sensitive Adhesive

SECTION XIV. PACKAGING HARDWARE

FF-B-561	Bolts, Screw, Lag
FF-B-584	Bolts, Finned Neck, Key Head, Machine, Ribbed Neck, Square Neck, Tee Head
FF-N-105	Nails, Brads, Staples and Spikes: Wire, Cut and Wrought
FF-N-836	Nut, Square, Hexagon, Cap, Slotted, Castellated, Knurled, Welding and Single Ball SEat
FF-S-111	Screw, Wood
MIL-P-3184	Packaging of Machinery: Deck and Vehicle Mounted With Associated Equipment and Repair Parts

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

SECTION XV. PALLETS AND SKIDS

NN-P-71	Pallet, Material Handling, Wood, Stringer Construction, 2 Way and 4 Way (Partial)
MIL-P-15011	Pallets, Material Handling, Wood, Post Construction, 4-Way Entry
MIL-P-15943	Pallet, Material Handling, Wood, Ship Cargo, Stevedoring, 48" Lg x 72" W 2-Way Entry
MIL-S-21859	Support Sets, Stacking, Material Handling Pallet
MIL-P-26342	Pallet Box, Fiberboard, Expendable, for Air Shipment
MIL-P-27443	Pallets, Cargo Aircraft, Type HCU-6/E, Type HCU-12/E and HCU-10/C
MIL-P-43465	Pallet, Material Handling, Wood, Double Faced (Special Design for Use With CONEX Containers)
MIL-STD-147	Palletized and Containerized Unit Loads 40" x 48" - Pallets, Skids, Runners, or Pallet-Type Base

SECTION XVI. PROTECTORS, CLOSURES, AND PLUGS

PPP-P-700	Protector, Packing List
MIL-C-5501	Caps and Plugs, Protective, Dust and Moisture Seal

SECTION XVII. SEALING EQUIPMENT

GG-M-565	Moistener, Paper Sealing (Well Type)
MIL-S-4461	Sealing Machines, Heat, Hot Jaw and Continuous
MIL-S-22783	Sealing Machines, Electrical Impulse (Jaw Type)

SECTION XVIII. STRAPPING AND STRAPPING EQUIPMENT

QQ-S-781	Strapping, Steel and Seals
PPP-S-760	Strapping, Nonmetallic (and Connectors)
MIL-S-17743	Stretcher, Steel Strapping, Hand
MIL-S-43104	Strapping and Sealing Kit, Hand-Operated

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

SECTION XVIII. (Continued)

MIL-S-43180	Sealer, Steel Strapping, Hand, Non-Powered
MIL-S-43361	Stretching and Sealing Machine, Strapping, Hand
MIL-R-43448	Reel, Strapping Coil and Trucks, Hand, Strapping Coil

SECTION XIX. TAPES

L-T-90	Tape, Pressure-Sensitive, Adhesive, (Cellophane and Cellulose Acetate)
L-T-99	Tape, Pressure-Sensitive Adhesive, Identification
L-T-100	Tape, Pressure-Sensitive Adhesive, Polyester Film
UU-T-101	Tape, Gummed, Mending and Reinforcing (Paper and Cloth)
PPP-T-42	Tape, Packaging/Masking, Paper
PPP-T-45	Tape, Gummed, Paper, Reinforced and Plain for Sealing and Securing
PPP-T-60	Tape, Packaging, Waterproof
PPP-T-76	Tape, Packaging, Paper, For Carton Sealing
PPP-T-97	Tape, Pressure-Sensitive Adhesive, Filament Reinforced
MIL-T-22085	Tape, Adhesive, Preservation and Sealing
MIL-T-43036	Tape, Pressure-Sensitive Adhesive, Plastic Film (For Sealing Fiber Containers and Cans)

SECTION XX. WINDOWS

MIL-W-10434	Window, Observation

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

THIS PAGE INTENTIONALLY LEFT BLANK

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

APPENDIX B

PROCESS DOCUMENTS

10. Scope.

10.1 This appendix includes process documents which would normally be listed in Section 2 of this standard. Because of the voluminous listings, it has been considered more practical to place them in this appendix.

10.2 This appendix also lists documents not referenced in this standard, but are included here as an aid to users of this standard. When used, the issues of the following process documents in effect on the date of invitation for bids or request for proposal, form a part of this standard to the extent specified herein.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

PPP-B-140	Battery, Storage, Industrial, Preparation for Shipment and Storage of
PPP-B-638	Box, Liners and Sleeves, Fiberboard, Knocked-Down, Flat, Packing of
PPP-C-186	Containers, Packaging and Packing for Drugs, Chemicals and Pharmaceuticals
PPP-C-2020	Chemical, Liquid, Dry and Paste: Packaging of
PPP-G-460	Glass Containers, Filled and Closed, Packaging and Packing of
PPP-H-1581	Hardware (Fasteners and Related Items) Packaging for Shipment and Storage of
PPP-I-350	Individual Serving of Subsistence, Packaging and Packing of
PPP-P-40	Packaging and Packing of Hand Tools
PPP-P-50	Packaging and Packing of Thread for Domestic and Overseas Shipment
PPP-P-130	Pail, Cans, and Waste Receptacles, Packaging and Packing of
PPP-P-600	Porcelain Enamel Products and Household Appliances, Electrical and Mechanical - Requirements for Packing
PPP-P-1132	Packaging and Packing of Woolen, Worsted and Wood Blend (Synthetic Fiber, Cotton) Fabrics
PPP-P-1133	Packaging and Packing of Synthetic Fiber Fabrics
PPP-P-1134	Packaging and Packing of Cotton and Cotton-Synthetic Fiber Blend Fabrics (Excluding Duck Fabrics)
PPP-P-1135	Packaging and Packing of Duck Fabrics (Cotton, Synthetic Fiber Cotton-Synthetic Fiber Blends)
PPP-P-1136	Packaging and Packing of Coated (Plastic, Rubber) and Laminated Fabrics
PPP-P-1260	Plywood, Packaging, Packing and Marking of
PPP-T-680	Tape, Pressure Sensitive Adhesive, Packaging and Packing of
PPP-T-681	Tape, Gummed, Packaging and Packing of

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

PPP-T-1150	Tools and Tool Accessories for Power Driven, Metal and Woodworking Machinery, Packaging and Packing of
MIL-V-3	Valve, Fittings, and Flanges (Except for Systems Indicated Herein), Packaging of
MIL-E-75	Electron Tubes, Packaging of
MIL-P-116	Preservation, Methods of
MIL-B-197	Bearings, Anti-Friction, Associated Part and Subassemblies, Packaging of
MIL-B-208	Battery, Storage, Lead Acid, Automotive and Navy, Portable (Except Aircraft), Packaging and Packing of
MIL-H-775	Hose, Rubber, Plastic, Fabric, or Metal (Including Tubing), and Fittings, Nozzles and Strainers, Packaging of
MIL-P-2845	Preservation, Packaging, Packing, and Marking of Main Propulsion Shafting, Bearing Boat and Ship Propellers and Associated Repair Parts
MIL-F-3222	Floodlights and Lanterns, Packaging of
MIL-F-3296	Forges, Furnaces, and Ovens (Exclusive of Space Heating and Cooking), Packaging of
MIL-T-3351	Tractor, Full Tracked, Low Speed, Tractor Wheeled, Agriculture and Tractor, Wheeled, Industrial, and Their Attachments, Packaging of
MIL-P-3454	Packaging and Packing of Life Preservers
MIL-S-3534	Surveying Instruments and Accessories, Packaging of
MIL-A-3816	Abrasives and Abrasive Products, Packaging and Packing of
MIL-N-3944	Nonferrous Products (Other than Aluminum, Magnesium, Copper, or their Alloys) Packaging and Packing of
MIL-C-3993	Copper and Copper-Base Alloy Mill Products, Packaging of
MIL-S-4473	Shielding Magnetron Tubes and Magnets for Air Shipment
MIL-P-4861	Packing, Preformed, Rubber, Packaging of
MIL-P-5610	Parachute Assembly and Subassemblies, Packing and Packaging of

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

MIL-E-6058	Engine, Aircraft, Reciprocating, Preparation for Shipment and Storage of
MIL-P-6074	Preservation, Packaging, and Packing of Propellers, Propeller Spares, and Propeller Accessories
MIL-I-8574	Inhibitors, Corrosion Volatile, Utilization of
MIL-P-9024	Packaging, Materials Handling and Transportability, System and System Segments, General Specification for
MIL-M-9950	Missile Components, Liquid Oxygen, Nitrogen, Gaseous Oxygen, Instrument Air, Helium and Fuel Handling Systems, Cleaning and Packaging for Delivery
MIL-E-10062	Engine, Preparation for Shipment and Storage of
MIL-P-11563	Flash Ranging Set AN/GTC-1, (Packaging and Packing of)
MIL-R-12499	Repair Equipment, Pneumatic Target, Packaging of
MIL-S-12651	Sprayer, Packaging of
MIL-B-12841	Basic Issue Items for Military Vehicles, Carriages and Equipment; Preparation for Shipment and Storage of
MIL-P-14232	Parts, Equipment and Tools for Army Material, Packaging and Packing of
MIL-P-14487	Sight, Computing, M38, Packaging of
MIL-P-14527	Pole Line Hardware, Preparation for Delivery of
MIL-E-16298	Electric Machines Having Rotating Parts and Associated Repair Parts, Packaging of
MIL-P-16789	Preservation, Packaging, Packing and Marking of Pumps, General, and Associated Repair Parts
MIL-O-16898	Optical Elements, Packaging of
MIL-E-17555	Electronic and Electrical Equipment, Accessories, and Repair Parts, Packaging and Packing of
MIL-M-18058	Machinery, Metal and Woodworking, Support Equipment and Associated Repair Parts, Preparation for Delivery of
MIL-S-19491	Semiconductor Devices, Packaging of

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

MIL-G-20697	Gun, Machine, Cal. 50, Browning, M2, Heavy Barrel, All Types, Packaging of
MIL-P-22084	Preparation of Household Goods and Personal Effects, for Local Transfer
MIL-P-23199	Packaging and Packing Requirements for Special Purpose Components and Repair Parts
MIL-S-23665	Sonobuoy, Detection Devices, Preservation, Packaging and Packing, Procedures for
MIL-C-23760	Coating, Sprayable, Strippable, Protective, for Preservation and Packaging of Weapon Systems and Components, Application of
MIL-P-25621	Preservation, Packaging and Packing of Rubber and Nylon Fuel, Oil, and Water-alcohol Cells
MIL-S-28786	Switches, Preparation for Delivery of
MIL-C-39028	Capacitors, Packaging of
MIL-R-39032	Resistors, Packaging of
MIL-L-43432	Leather, Packaging and Packing of
MIL-C-45008	Carbine, Caliber .30, M1, M2, and M3, Packaging of
MIL-P-45213	Rocket and Missile Systems Equipment, Preservation and Packing of
MIL-T-45542	Tool Set, Shop Sets and Kits (Hardware, Installation, Modification and Tool) Both Common and Special, Packaging of
MIL-V-45554	Vulcanizing Equipment, Including Related Items, Tire, Rebuild and Repair, Preparation for Delivery of
MIL-W-45562	Welding and Soldering Equipment, Supplies and Accessories, Packaging of
MIL-F-45687	Fire Control Electronic Calibration Standards, Packaging of
MIL-L-45779	Loader-Transporter, Guided Missile, XM501E1 and XM501E3, Processing for Shipment and Storage of
MIL-D-46845	Design Requirements for Missile Weapon Systems, Packaging and Packing

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

MIL-C-55330	Connectors, Electrical and Fiber Optic, Packaging of
MIL-C-55442	Cable Assemblies and Cord Assemblies, Packaging of
MIL-C-55565	Microcircuits, Preparation for Delivery of
MIL-E-55585	Electronics Equipment and Parts, Packaging of
MIL-P-60412	Packaging, Packing and Marking for Shipment of Artillery Type and Rocket Fuzes, General Specification for
MIL-V-62038	Vehicle, Wheeled, Preparation for Shipment and Storage of
MIL-C-62084	Carrier, Guided Missile Equipment, XM667, Processing for Storage and Shipment of
MIL-G-81559	Gyroscope Assemblies, Attitude and Directional Reference Instruments for Aircraft; Preservation, Packaging and Packing for
FED-STD-101	Test Procedures for Packaging Materials
FED-STD-102	Preservation, Packaging and Packing Levels
FED-STD-123	Marking for Shipment (Civil Agencies)
FED-STD-147	Tape, Packaging, Adhesive and Gummed, Method of Inspection, Sampling and Testing
MIL-STD-107	Preparation and Handling of Industrial Plant Equipment for Shipment and Storage
MIL-STD-129	Marking for Shipment and Storage
MIL-STD-162	Material Handling Equipment, Preparation for Shipment, Storage, Cyclic Maintenance, Routine Testing and Process
MIL-STD-163	Steel Mill Products, Preparation for Shipment and Storage
MIL-STD-212	Preparation of Household Goods for Shipment and Storage and Related Services
MIL-STD-281	Automobile, Trucks, Truck-Tractors, Trailers and Trailer Dollies, Preservation and Packaging of
MIL-STD-290	Packaging, Packing and Marking of Petroleum and Related Products

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

MIL-STD-644	Visual Inspection Standards and Inspection Procedures for Inspection of Packaging, Packing and Marking of Small Arms Ammunition
MIL-STD-647	Packaging Standards, Preparation and Use of
MIL-STD-649	Aluminum and Magnesium Products, Preparation for Shipment and Storage
MIL-STD-726	Packaging Requirements Code
MIL-STD-834	Packaging Data Forms, Instructions for Preparation and Use of
MIL-STD-1169	Packaging, Packing and Marking for Shipment of Inert Ammunition Components
MIL-STD-1186	Cushioning, Anchoring, Bracing, Blocking and Waterproofing, With Appropriate Test Methods
MIL-STD-1188	Commercial Packaging of Supplies and Equipment
MIL-STD-1342	Limited Shelf Life Electronic Equipment and Parts, Preparation for Delivery of
MIL-STD-1510	Container Design Retrieval System, Procedures for Use of
MIL-HDBK-304	Package Cushion Design
MIL-HDBK-701	Blocking, Bracing and Skidding of Industrial Production Equipment
MS27757	Pack, Instrument, With Star Design Polyurethane Cushioning Insert (For Delicate Items)
MS27766	Shroud for Aerospace Ground Equipment

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

THIS PAGE INTENTIONALLY LEFT BLANK

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

APPENDIX C

QUALITY ASSURANCE AND PACKAGING DESIGN VALIDATION PROVISIONS

10. Quality assurance and packaging design validation provisions.

10.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the standard where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

10.1.1 Alternate test procedure approval. In instances wherein a test may necessitate an impossible or impractical manipulation of a mounted preserved item or where the overall size or weight of the item or test equipment obviates compliance with a specific test requirement of this standard, the contractor may propose an alternative test procedure for approval.

10.2 Classification of inspections and tests. The inspection and testing of a complete pack shall be classified as follows:

a. Packaging design validation tests. Packaging design validation tests consists of those examinations and tests conducted prior to production on prototype packs to determine the design's capability to meet the test requirements of this standard (see 10.3).

b. Quality conformance inspection. Quality conformance inspection consists of those examinations and tests required to be performed for acceptance under contract (see 10.4).

10.3 Packaging design validation tests. Packaging design validation tests shall consist of all the examinations and tests specified under 10.5. Packaging design validation tests are intended to prove the adequacy of the preservation, blocking, bracing, cushioning and container for protecting the item. Rough handling tests shall be followed by the applicable preservation (unit package) tests of MIL-P-116 before the final design is approved. One prototype pack will suffice if it succeeds in passing the tests, unless otherwise specified. To pass the packaging design validation, the contained item(s) after testing shall evidence no damage to its structural integrity, shall remain within all dimensional tolerances, and shall be serviceable. The container shall remain structurally sound. Waterproof papers, moisture-vaporproof barriers, wrappings, interior containers, bracing, blocking, bolting, and cushioning shall be intact and still capable of providing the intended protection. Packaging design validation tests shall be conducted under Government supervision.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

10.3.1 Dummy load. When a dummy load is substituted for the item in performing the rough handling tests of Table I of this appendix for the packaging design validation tests, the details of instrumentation, e.g., location of accelerometers, shall be approved by the acquiring activity via the technical packaging element of the contract administration activity. When the equipment to be simulated includes integral internal shock/vibration isolation mounts, these mounts shall be included in the dummy load. A load shall be suspended on these mounts equivalent in weight and center of gravity to that suspended on the mounts in the equipment, and they shall be spaced and located as in the equipment. In this case the accelerometers shall be located as close as practicable to the cg of the suspended weight. After instrumentation, the pack shall be tested in accordance with Table I of this appendix and the resultant acceleration shall be less than the fragility rating of the item. A report of the instrumentation and test results shall be made available to the acquiring activity.

10.4 Quality conformance inspection.

10.4.1 Materials. All materials to be used in cleaning, preservation, and packing shall be inspected in accordance with the applicable material specification or certified inspection and laboratory test reports shall be furnished which show that the material, as furnished, conforms to the detailed specification.

10.4.2 Preservation inspection. Preservation inspection shall be in accordance with the quality assurance provisions of MIL-P-116 and consist of all the applicable examinations and tests as specified therein.

10.4.3 Packing inspection. Packing inspection shall consist of the examination of applicable characteristics specified in the following classification of defects:

Classification of Defects

Characteristic Number	Major Characteristics
101	Quantity of items in container incorrect or not as specified
102	Shipping container not in accordance with specification
103	Improper or inadequate cushioning, blocking or bracing
104	Excessive void in container
105	Case liner omitted, improperly sealed, punctured or damaged

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

Classification of Defects (Continued)

Characteristic Number	Major Characteristics
106	Closure of container not in accordance with specification
107	Weight and size of packed container exceeds specification limitations
108	Strapping or banding omitted, improperly applied or not in accordance with specification
109	Skidding improper or inadequate
110	Shipping documents or packing list omitted
111	Marking omitted, incorrect or illegible

10.4.3.1 Lot formation. A lot shall consist of all packs made of the same materials, made during an identifiable period, and submitted at one time for inspection.

10.4.3.2 Sampling for examination. Sampling for examination shall be in accordance with MIL-STD-105 using a single sampling plan. Samples shall be selected at random from each lot at inspection level S-4. A sample unit shall be one pack. Unless otherwise specified in the contract or order, acceptance or rejection of lots shall be based on the classification of defects and an acceptable quality level (AQL) of 4.0 percent defective.

10.5 Test methods.

10.5.1 Rough handling tests. The rough handling test procedures, shall be in accordance with Fed. Test Method Std. No. 101 for the level of packing specified in the contract. Methods to be used are specified in Table I.

10.5.1.1 Applicability of tests.

10.5.1.1.1 Small containers. Only free-fall drop tests and vibration tests shall apply to small containers; either vibration test shall be conducted at the option of the contractor. Small containers are those having no one edge or diameter over 60 inches and a gross weight of 150 pounds or less.

10.5.1.1.2 Large containers. All rough handling tests, except for free-fall tests, shall apply to large containers. Either vibration test shall be conducted at the option of the contractor. However, tipover tests will apply only when additionally specified. Either

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

impact test shall be conducted at the option of the contractor. Large shipping containers are those measuring more than 60 inches on any one edge or diameter, or those which, when loaded, have gross weights in excess of 150 pounds.

10.6 Disposition of samples after test. All samples used shall be reprocessed as necessary. When the packaged item may have been damaged as a result of testing, the item shall be inspected as necessary to determine its acceptability.

10.7 Marking of containers for free-fall drop tests. Marking of the specimen containers prior to test shall be as follows and as indicated in Figure 1.

10.7.1 Bags and cylindrical containers. Bags and cylindrical containers shall be marked as outlined in the applicable test method.

10.7.2 Square containers. Square containers shall be marked as follows:

Place the container with lid or opening surface uppermost. This surface shall be marked "Top." The opposite surface shall be marked "Bottom." Select one of the remaining surfaces and mark as Side A. The opposite surface shall be marked Side B. The remaining surface which is counterclockwise from Side A shall be marked Side D. The remaining surface shall be marked Side C.

The corners shall be marked with even-numbered corners on top and odd-numbered corners on bottom. The corner at the junction of Side A and Side D shall be marked Number 6. The diagonally opposite corner shall be marked Number 8. The corner at the junction of Side B and Side D shall be marked Number 2. The diagonally opposite corner shall be marked Number 4. Corner Number 1 shall be under corner Number 4, 3 under 2, 5 under 8 and 7 under 6.

10.7.3 Rectangular containers. Rectangular containers shall be marked as follows:

Place the container with the lid or opening surface uppermost. This surface shall be marked "Top." The opposite surface shall be marked "Bottom." One of the longest remaining surfaces shall be marked Side A. The opposite surface shall be marked Side B. The remaining surface which is counter clockwise from Side A shall be marked Side D. The remaining surface shall be marked Side C.

The corners shall be marked as prescribed in 10.7.2.

10.8 Sequence of free-fall drop tests for Procedures B and E in Table I. The sequence of drops shall be bottom, top, A, B, C, and D for Procedure B and corners 1 through 8, in sequence for Procedure E.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

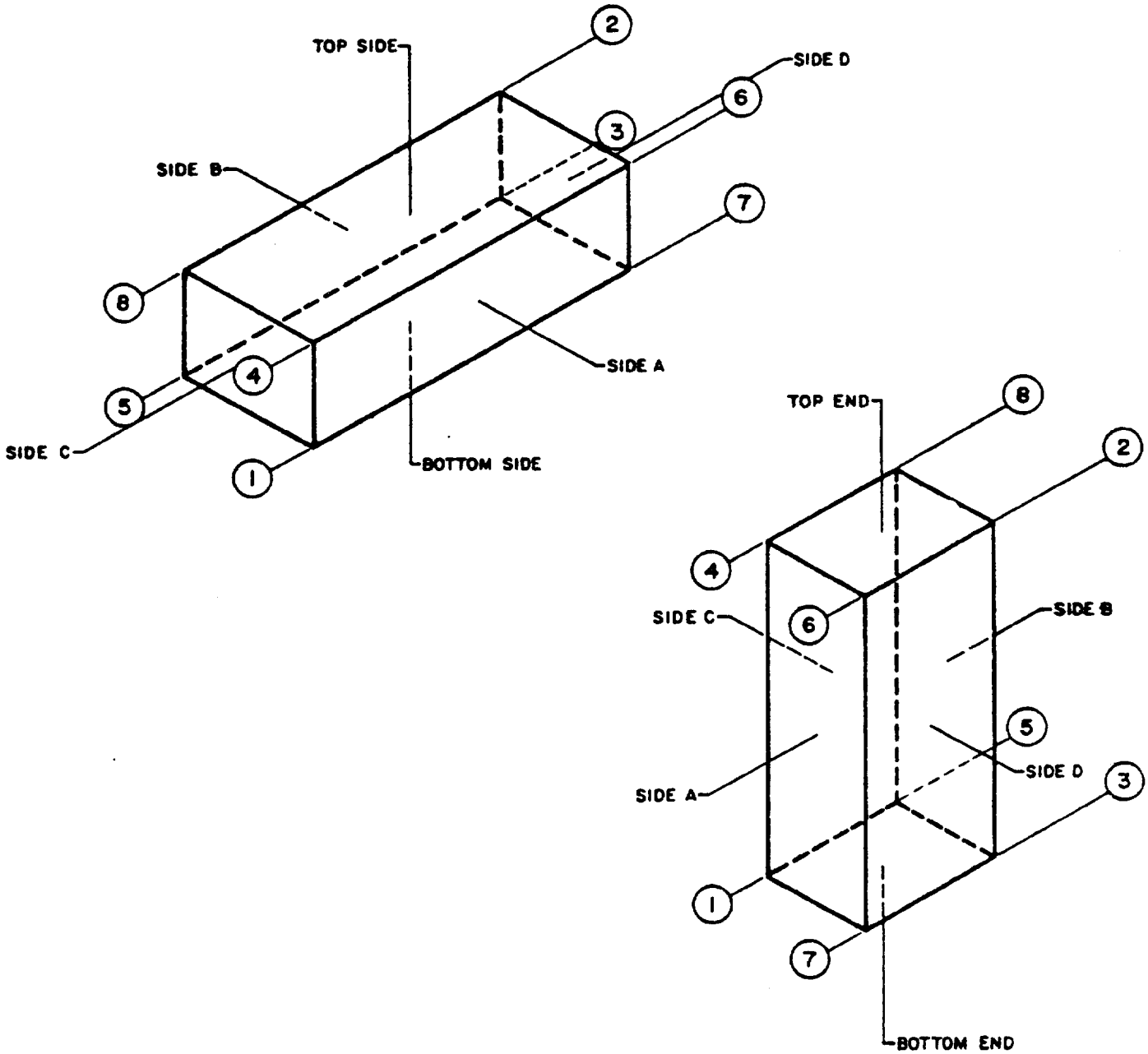


FIGURE 1. Marking the specimen containers prior to test.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE I. Rough handling tests.

Test	Method of FED-STD-101		Special requirements or exceptions
	Cylindrical Containers	Rectangular Containers	
Free-fall drop tests:			See notes 1, 2 and 3
Corner drop	N/A	5007 Procedure E	
Flat drop	N/A	5007 Procedure B	
Cylindrical Container Drop	5007 Procedure D	N/A	
Tipover	N/A	5018	
Rotational drop tests			See notes 1 and 2
Edgewise	N/A	5008	
Cornerwise	N/A	5005	
Impact tests:			See notes 1 and 4
Pendulum	N/A	5012	
Incline	N/A	5023	
Superimposed load:			See note 5
(stackability with dunnage)	5016	5016	
(uniformly distributed without dunnage)	5017	5017	
Vibration:			See note 1
Sinusoidal motion	5020	5020	
Repetitive shock	5019	5019	

NOTES:

1. Except as stipulated in Note 2 below, the contractor shall have the option as to what method is to be applied in accomplishing the free-fall, rotational, impact and vibration tests.

2. Rectangular containers employing installed cushion pads, bracing or other shock mitigrating/isolating systems shall be subjected to corner and flat drops or to edgewise and cornerwise rotational drops, as applicable. The drop test sequence for the free-fall drops of Procedures B and E in Test Method 5007 of FED-STD-101 shall be:

DROP NO.	CORNER DROPS	DROP NO.	FLAT DROPS
1	Corner 1		
2	Corner 2		
		3	Bottom
		4	Top
5	Corner 3		
6	Corner 4		
		7	Side A
		8	Side B
9	Corner 5		
10	Corner 6		
		11	Side C
		12	Side D
13	Corner 7		
14	Corner 8		

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE I. Rough handling tests (Continued).

3. Items having a net weight exceeding 100 pounds and which are secured to a base within, or to the base of, a container shall be tested as indicated for large containers.

4. For container or container unit loads which are likely to be individually loaded aboard ship by conventional methods, transferred at sea, issued to ground troops, or otherwise identified by the design activity, the impact tests in the longitudinal direction shall be conducted at 10 ft/sec.

5. Unless otherwise specified, both methods shall be applied.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

THIS PAGE INTENTIONALLY LEFT BLANK

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

APPENDIX D

SELECTION OF PRESERVATION METHODS AND CODED DATA SYMBOLS

10. Scope.

10.1 Scope. This appendix provides the technical guidance for selection of methods and details for packaging of military supplies. Basic determination of an item's characteristics pertinent to its packaging requirements necessitates knowledge of certain significant features of that item. These are the construction (composition and surface chemistry), criticality of the surface, finish, compatibility with contact preservatives, and such physical factors as size, weight and fragility. Tables are provided for the selection of preservation method, and coded symbols are established in this appendix.

10.1.1 Category code. The code derived from Tables I, II, III and IV is reduced to a convenient form for manual categorization, or is capable of being stored or manipulated by electronic data processing (EDP) methods. The coded elements are intended to be a tool for selection of appropriate codes from MIL-STD-726. It is intended to limit this appendix to the selection processes necessary to obtain the data so that an adequate package to protect the item can be achieved manually or by EDP. Information contained relates to the following principal categories:

a. First category. The chemical and physical characteristics of an item to be considered in the selection of a MIL-P-116 method of preservation.

b. Second category. The weight and fragility characteristics of an item to be considered in the selection of a MIL-P-116 submethod of preservation.

c. Third category. Preservative requirements for the item.

10.2 Application. The requirements of this document are applicable to all items in the military supply system.

20. Definitions.

20.1 Categorization. The process of evaluating an item for the purpose of identifying and classifying certain chemical and physical characteristics that are significant in determining the preservation requirements. By establishing criteria for defining and identifying these characteristics, a means is provided so that items with the same features can be identified to a specific group for which required packaging can be standardized.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

20.2 Common group items. Items that can be categorized by chemical, physical and other characteristics shown in Tables I thru IV and for which complete packaging details can be specified by predetermined MIL-STD-726 coding.

20.3 Unique group items. Items that cannot appropriately utilize packaging developed by common group technique yet do not require a drawing, sketch, illustration or narrative type instruction to specify packaging details. These can be described in MIL-STD-726 codes developed for each item in this group.

20.4 Special group items. Items that, because of peculiar characteristics such as excessive weight, configuration, complexity, fragility or other considerations, prevent the use of common or unique groupings. An item is considered special if drawings, sketches, illustrations or narrative type instructions identified to the item are required to specify packaging details.

20.5 "Manual" data preparation. Preparation of packaging data that are developed and documented without the use of electronic data processing equipment.

20.6 "Machine Developed" data. A system of data preparation that employs electronic data processing equipment (computers). The system provides for the automatic production of complete packaging data from basic input data specific to the individual common/unique items. The term applies to data that can be stored, sorted, analyzed or developed by electronic data processing machines.

20.7 Input data. The basic data that must be put into the computer for each line item to obtain complete packaging data in a standardized format.

20.8 Programmed data. Information stored in the computer. This information includes the formulas, equations and constants that, when correlated to item input data, are used by the computer to produce the required output.

20.9 Output data. The output data are a combination of input, stored data, calculations and determinations made by the computer and presented in a predetermined format.

30. Categorization.

30.1 Categorization. Items shall be categorized by identification of their chemical, physical and certain other characteristics.

30.1.1 Item characteristics. Categories represent the summation of pertinent chemical, physical and other characteristics that significantly influence the packaging required for adequate protection of items. The designation of the appropriate characteristics of each

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

category, in the sequence as listed, provides a four-digit identification that permits the grouping of items. Items thus grouped, which may be dissimilar in their function, have the same characteristics and therefore require the same degree of protection.

30.1.2 First category. The first category encompasses the determination of those characteristics that directly influence the method of packaging (Methods III, I, IC, IA or II of MIL-P-116) needed to afford the protection required. These are:

a. Composition - condition
b. Critical - non-critical
c. Preservative

30.1.2.1 Item characteristics and symbols. To provide a uniform method of placing items into identifiable groups, the divisions of each category have been provided with identifying codes. These codes, when arranged in order, result in a unique four-digit numeric-alpha symbol, e.g. 15A0. The codes for each category are shown in Tables I thru IV.

30.1.2.2 Characteristic consideration. Before packaging requirements can be determined, the characteristics of the item must be examined and recorded. Tangible considerations include:

a. Surface chemistry
b. Surface mechanical (finish)
c. Fragility
d. Size and weight

These determinations are made by physical examination of the item and, if necessary, research of the background data. Other considerations require a thorough knowledge of the item that includes physical composition, structure, operational application and function. With this knowledge, the determinations of preservative compatibility, sensitivity to shock, vibration or distortion and the importance of reliability, can be established. All of these characteristics shall be considered to determine the appropriate division of each category that most accurately describes the item.

30.1.2.3 Critical, noncritical and preservative applicability. The determination of the appropriate classification, noncritical, critical and preservative applicability is dependent upon the following considerations:

a. Degree of machining performed on item surface or surfaces.

b. Item function and relative importance in the operation of the assembly or end item.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

c. Requirement for high reliability where failure of the item could result in total loss of equipment and operating personnel.

d. Receptivity of the item to preservative application without damaging the item or causing potential malfunction during operation.

30.1.2.4 Critical group items (C). Items shall usually or generally be classified critical if their characteristics are determined to meet one or more of the following conditions:

a. The metallic surface(s) of the item is machined to close tolerances and/or high finish. The surface is prepared for close fit and intimate contact, when assembled, with the surface(s) of a mating part. Operationally, these surfaces are:

1. Mating parts, driving gears, bushings, shafts, bearings, etc.

2. Secured to surface of a mating part to obtain a seal (metal to metal).

3. Threaded with closely controlled dimensions and geometry, and are utilized in the controlled variable movements of components of assemblies for adjustment, calibration, etc.

b. Metallic or nonmetallic compositions are worked by grinding or polishing to attain highly polished surfaces as in optical and reflective devices.

c. Application of preservative to the item is prohibited for one of the following reasons:

1. Preservative application would damage the item.

2. Preservative applied would be excessively difficult to remove.

3. Presence of any residual preservative would be incompatible with operational fluids, oils or greases and would potentially cause malfunction during operation.

d. Items whose functions in assembly and during operations are considered relatively more significant than brackets, hardware, castings, wiring, etc.

30.1.2.5 Noncritical group items (blank). Noncritical items are those that do not meet the criteria established for critical group items in 30.1.2.4.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

30.1.2.6 Preservative permitted (blank) or prohibited (P). The determination of whether or not a preservative shall be applied is guided by:

a. Criteria established in 30.1.2.4c.

b. Items with chemical compositions that are resistant to deterioration do not require a preservative to assure appropriate protection whereas items susceptible to deterioration do require a preservative, such as iron and steel unless prohibited by other factors.

30.1.3 Second category - weight/fragility. This category is devised to establish definitive controls for weight/fragility grouping of items. These divisions determine the preservation submethod and cushioning for the item and, therefore, have direct influence on the container that will be utilized. It provides a means of separating those items which will permit the use of a bag-type container from those requiring containers of greater strength or other desired qualities. The weight/fragility limitations and symbols for the divisions are found in Table III.

30.1.4 Third category - preservative. This category is devised to establish preservative application control. The most commonly used preservatives are reflected in Table IV. If the desired preservative is not located in the table, a "Z" code will be designated in the preservative category.

30.1.5 Packaging by use of predetermined data. The designation of the item characteristics is representative of a group of items for which a single method of preservation can be established. This 4-digit category code symbol is used to obtain the corresponding predetermined packaging requirement for the protection of the item (see Table V).

30.1.6 Validation of packaging design for common group items. Packaging data prepared for items in the common groups shall be developed without individual validation and testing of the packaged item.

30.1.7 Validation of packaging design for unique and special group items. See 5.9 for requirements.

40. Detailed requirements.

40.1 Method of recording requirements Method of recording decisions must be compatible with anticipated computerized data base.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

40.2 Formulas. Table VI of this appendix contains the formulas for calculating the weight and sizes of barrier materials, containers, wraps and cushioning for the bill of material determination. The data contained in MIL-STD-726 must be used in conjunction with the formulas in order to arrive at the weight and dimensions of the package.

40.3 Cushioning correlation. Figure 1 of this appendix contains cushioning material correlation data that can be used in the selection of cushion material. However, MIL-HDBK-304 should be used as a guide in designing cushioning systems.

40.4 Container selection. For reference purposes, Table VII of this appendix lists various containers with their weight limitations. This data can be used in the selection of the most economical container for the required packaging performance.

40.5 Approximate fragility of various packaged items. Table VIII provides ranges of fragility for types of items common to the DOD inventory. This table is based primarily on product specifications. Product specifications generally require that the item function normally while under a specified minimum stress, usually centrifugal, expressed in G's.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

FIGURE 1. Cushioning correlations for drops of 30 inches.

Bound Fiber

Type II

G's	Thickness	psi
60	2"	.035 - .04
40	3"	.035 - .04
30	4"	.035 - .05
20	5"	.038 - .08

Type III

G's	Thickness	psi
50	2"	.04 - .09
40	3"	.04 - .10
30	4"	.04 - .10
20	5"	.06 - .15

Type IV

G's	Thickness	psi
50	2"	.035 - .06
40	3"	.035 - .09
30	4"	.05 - .10
20	6"	.06 - .15

Bound Fiber
Load per square inch to compress 50%

Med. Soft II	6 ounces
Med. Firm III	9 ounces
Firm IV	14 ounces

Polystyrene
1.5 pcf

G's	Thickness	psi
80	2"	.5 - 1.0
60	3"	.7 - 1.4
40	4"	.9 - 1.25
30	5"	1.0 - 1.6

Polyethylene
2 pcf

G's	Thickness	psi
60	2"	.4 - .6
50	3"	.3 - 1.0
40	4"	.35 - 1.0
30	6"	.4 - 1.5

Polyurethane

Polyester
2.0 pcf

G's	Thickness	psi
50	2"	.15 - .25
40	3"	.10 - .50
30	4"	.2 - .50
20	5"	.35 - .40

Polyester
4.0 pcf

G's	Thickness	psi
60	2"	.06 - .40
50	2"	.10 - .30
40	3"	.08 - .40
30	5"	.20 - .30

Polyester
1.5 pcf

G's	Thickness	psi
70	2"	.07 - .20
60	3"	.06 - .6
40	4"	.10 - .5
30	5"	.20 - .40

Polyether
2.0 pcf

G's	Thickness	psi
40	2"	.04 - .10
30	3"	.05 - .14
20	4"	.7 - .14

Polyether
4.0 pcf

G's	Thickness	psi
60	2"	.04 - .20
40	3"	.04 - .20
30	4"	.06 - .25
20	5"	.10 - .20

Polyether
1.5 pcf

G's	Thickness	psi
40	2"	.03 - .09
30	3"	.035 - .10
20	4"	.05 - .12

This table permits quick comparison between cushioning materials based on: item fragility, capacity of different cushioning materials to absorb energy, and cushion thickness.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE I. Chemical and physical characteristics.

NON-ELECTRICAL

BARE METALS

Iron, steel Includes all stainless varieties except those having minimum compositions of 17Cr-7Ni. GP.01, 02, 03, 04, 05, 06, 07, 08
Magnesium GP.09, 10, 11, 12, 13, 14
Beryllium, Brass, Bronze, Cadmium, Copper, Lead, Monel, Rough Copper Alloy Castings, Sintered Copper Alloys, Nickel-Cobalt, Silver, Stainless Steel, Titanium, Tin, Zinc GP.15, 16, 17, 18, 75, 76
Aluminum Babbitt Porous Steel GP.19, 20, 21, 22, 77, 78

PLATED COATED SURFACE

Iron or steel fully plated with: chromium, copper, nickel, silver, tin, gold, iridium, osmium, palladium, rhodium, or ruthenium GP.23, 24, 25, 26, 79, 80
Ferrous metals (iron or steel) fully plated with zinc, cadmium, lead or terne; Nonferrous metals (other than iron or steel) that have been plated GP.27, 28, 29, 30, 81, 82
Iron, steel, magnesium, copper or brass which have parkerized, bonderized, blued, dichromate or black oxide finish over entire surface GP.31, 32, 33, 34, 35, 36
Anodized aluminum, magnesium or zinc; zinc-plated iron or steel, zinc alloy castings or magnesium to which chromate coatings have been applied; alclad aluminum GP.37, 83
Metals that are painted, varnished, lacquered or enameled GP.38

NONMETAL

Plastics or fiber GP.39 Protect from water or fungus GP.40
Natural or synthetic rubber GP.41 With optical glass, protect from fungus growth GP.42
Leather Small amount mold permitted GP.43 No mold permitted GP.44
Optical glass, quartz, mica and assemblies using these as component parts. Protect from fungus growth GP.45
Carbon, graphite, asbestos, ceramics and glass (other than optical) GP.46, 84
Paper wood or cork Protect from physical damage GP.47, 49 Protect from oil or water GP.48, 50
Cordage and items made of cloth Treated GP.51 Not treated GP.52
Textiles Protect from shrinkage, decay, etc. GP.53

ELECTRICAL INSTRUMENTS AND EQUIPMENT

Sealed

Contains any material but no component *parts of* equipment GP.54

Not Sealed

Steel, iron and magnesium GP.55, 56, 57, 58	
Optical glass, quartz and mica GP.59	
Copper, bronze, brass, beryllium GP.60	
Gold, silver, platinum and iridium and other precious metals GP.61	
Parts move on bearings (any material) GP.62	
Parts electrically balanced or calibrated	Bare steel, iron or magnesium GP.63
	Other GP.64
Metals that are varnished, lacquered or given other equivalent protective coatings GP.65	
Metals which have parkerized, bonderized, blued, dichromate or black oxide finish over entire surface. Includes nonmetallic combinations GP.66, 67	
Not made of bare steel, iron, or magnesium not made of bare silver, copper, bronze, beryllium, optical glass, quartz, or mica GP.68	
End product may contain any material (not sealed) GP.70, 71, 72, 73, 85	
End product may contain any material (sealed) GP.74	

Preservation method determination

(a) Determine chemical or physical characteristics and assign item to proper category (Bare metal items, etc.) and division within the category (Iron, steel, etc.).

(b) Check group (GP) No. within the division and ascertain from the group description in Table II the group which is applicable based on surface criticalness and preservative compatibility of the item.

(c) Assign the group No. and basic MIL-P-116 method to the item derived from the group description.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE Ia. Group descriptions leading to basic MIL-P-116 methods.

(GP)	Iron, Steel						Magnesium						Beryllium, Brass, etc.						Aluminum, etc.					
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Bare metals					P	P	P	P			P	P	P	P	P	P	P	P					P	P
Contact preservatives:																								
Surfaces or applications:			C	C			C	C			C	C				C	C	C			C	C	C	C
Combination with nonmetallic materials:		T		T		T		T		T		T		T		T		T		T		T		T
Preservation method:		1	IC	IC	IC	IC	11	11		1	11	11	11	11	111	11	IC	IC	1	1	1	1	IC	IC

(GP)	Iron, Steel, Chromium Plated, etc.					Ferrous, Zinc Plated, etc.					Iron, Steel, Perforated, etc.					Anodized Aluminum, etc.					Metal Painted, etc.				
	23	24	25	26	99	27	28	29	30	01	02	31	32	33	34	35	36		37			83			38	
Contact preservatives:	P	P	P	P		P	P	P	P			P	P	P	P				P			P			P	
Surfaces or applications:	C	C			C	C			C	C					C	C	C	C				C				
Combination with nonmetallic materials:		T		T			T		T				T				T					T				
Preservation method:	IC	IC	111	111	1	111	111	IC	IC			111	111	IC	IC	1	1		111			Note 1/			111	

(GP)	Plastic	Rubber	Leather	Optical Parts		Carbon	Paper, Wood, etc.		Cordage, Textile etc.		
	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
Surface or applications:				C		C		C							C
Preservation method:	111	IC	IC	IC	111	IC	IC	IC	111	IC	111	IC	111	IC	IC

(UP)	SEALED AGAINST WATER AMT MATERIAL	NOT SEALED AGAINST ENTRANCE OF WATER?													No Bare Metal	End product may contain bare metal (not sealed)				End product may contain bare product (sealed)
		Steel, Iron, Mag.			Optical	Copper	Parts Cold	Movable	Elect. Sol.	Varnish	Perforated									
	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	70	71	72	73	85
Contact preservative:	P	P	P			P	P	P	P	P	P	P	P			P	P		P	P
Surface or application:			C	C		C		L										C	C	C
Movable parts:								WP	WP	WP	WP		WP	WP						
Preservation method:	111	11	11	11	11	IC	IC	IC	IC	11	11	111	IC	IC	111	Note IC/1A	Note 1/	11	IC/1A	Note 2/

CONTACT PRESERVATIVE
P - PROHIBITED
BLANK - PERMITTED
SURF. OR APPL.
C - CRITICAL
BLANK - NOT CRITICAL

CONS. NONMETAL MAT'L
Y - CONSIDERED
BLANK - NOT CONSIDERED
MOVABLE PARTS
WP - HAS MOVABLE PART
BLANK - NO MOVABLE PART

Note: 1/ Package to requirements of non-metal present.
2/ Package according to material and finish. Critical internal surfaces protected by operational fluid.

3/ Package according to material and finish at most critical external surface.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE II. Determination of method of MIL-P-116.

Bare metal items other than electrical

Composition or Condition	Group No. 1/	Contact Preservative Prohibited	Has Critical Surfaces or Application	Has Non-Critical Surfaces	Combined With A Nonmetallic Material 2/	Method of MIL-P-116 4/	Notes
Iron Steel 2/ (Bare or black oxide coated) Includes all stainless varieties except those having minimum compositions of 17Cr-7Ni 2/	1			X		I	P2 and P6 are the preservatives most generally used where complete application or removal of a light grease presents no problem. P10 is generally used for items with inaccessible areas where removal of a preservative compound would be difficult.
	2			X	X	I	
	3		X			IC	
	4		X		X	IC	
	5	X		X		IC	
	6	X			X	IC	
	7	X	X			II	
	8	X	X		X	II	
Magnesium (Bare or chromated)	9			X		I	P2 and P6 preservatives only, shall be used.
	10			X	X	I	
	11	X	X			II	
	12	X	X		X	II	
	13	X		X		II	Due to magnesium susceptibility to corrosion none can be tolerated. Maximum protection required for non-critical items.
	14	X		X	X	II	
Beryllium Nickel- Brass Cobalt Bronze Silver Cadmium 3/ Stainless Copper Steel Lead Titanium Monel Tin Zinc 5/ Rough Copper Alloy Castings, Sintered Copper Alloys	15	N/A		X		III	
	16	N/A		X	X	Note	Package to requirements of nonmetal present.
	17	X	X			IC	
	18	X	X		X	IC	
	75		X			I	The most generally used preservatives are P2 and P6.
	76		X		X	I	
Aluminum Babbitt	19	N/A		X		III	Bars, ingots, or other forms of these materials where melting before use or oxidation is permitted.
	20			X	X	Note	Package to requirements of nonmetal present.
	21		X			I	The most generally used preservatives are P2 and P6.
	22		X		X	I	
	77	X	X		X	IC	
	78	X	X			IC	

1/ Group number refers to "Material and Finish" column of the Packaging Data Forms of MIL-STD-834.
2/ When a higher degree of protection is specified for the nonmetal, change method of packaging per requirement of the nonmetal present. Do not apply preservative or lubricant to nonmetallic materials.
3/ Cadmium is not inherently resistant to corrosion under the conditions cited in Section 6 of QQ-P-416.
4/ When the weight or size limitations of Method IC are exceeded, or the appropriate submethod of IC is not adequate, use the appropriate submethod of IA.
5/ Zinc is not inherently resistant to corrosion when exposed to salt atmospheres or where periodic condensation of moisture is likely to occur, or on such areas as threaded fittings where consistency of deposits are hard to control.

N/A - Not applicable.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE II. Determination of method of MIL-P-116 (Continued).

Plated coated surface items other than electrical

Composition or Condition	Group No. 1/	Contact Preservative Prohibited	Has Critical Surfaces or Application	Has Non-Critical Surfaces	Combined With A Nonmetallic Material 2/	Method of MIL-P-116 3/	Notes
Iron or steel fully plated with chromium, copper, nickel, silver, tin, gold, iridium, osmium, palladium, rhodium or ruthenium	23	X	X			IC	
	24	X	X		X	IC	
	25	X		X		III	
	26	X		X	X	Note	Package to requirements of nonmetal present.
	79		X			I	
	80		X		X	I	
Ferrous metals (iron or steel) fully plated with zinc, cadmium, lead or terne; Nonferrous metals (other than iron or steel) that have been plated	27	N/A		X		III	Platings generally provide adequate corrosion protection.
	28	N/A		X	X	Note	Package to requirements of nonmetal present.
	29	X	X			IC	
	30	X	X		X	IC	
	81		X			I	
	82		X		X	I	
Anodized aluminum magnesium or zinc; zinc alloy castings; alclad aluminum	37	N/A		X		III	These surface treatments afford good corrosion protection without need for contact preservatives.
	83	N/A		X	X	Note	Package to requirements of nonmetal present.
Metals that are painted, varnished, lacquered or enameled	38	N/A		X		III	Surface finishes act as mechanical barriers between metal and corrosive environment.

1/ Group number refers to "Material and Finish" column of the Packaging Data Forms of MIL-STD-834.
2/ When a higher degree of protection is specified for the nonmetal, change method of packaging per requirement of the nonmetal present. Do not apply preservative or lubricant to nonmetallic materials.
3/ When the weight or size limitations of Method 1C are exceeded, or the appropriate submethod of IC is not adequate, use the appropriate submethod of IA.

N/A - Not applicable.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE II. Determination of method of MIL-P-116 (Continued).

Non-metal items other than electrical

Composition or Condition	Group No. 1/	Contact Preservative Prohibited	Has Critical Surfaces or Application	Has Non-Critical Surfaces	Combined With A Nonmetallic Material 2/	Method of MIL-P-116 3/	Notes
Plastics or fiber	39			X		III	Items generally resistant to factors causing deterioration.
	40		X			IC	Items requiring protection against water or oil damage or fungus growth.
Natural or synthetic rubber	41		X			IC	Protection required against air, light, heat distortion and oil damage.
	42			X		III	
Leather	43			X		III	Small amount of mold will not render items unserviceable.
	44		X			IC	Items on which mold or decay cannot be tolerated.
Optical glass, quartz, mica and assemblies using these as component parts	45		X			IC	Protection required against fungus growth.
Carbon, graphite, asbestos, ceramics and glass (other than optical)	46			X		III	Items resistant to chemical action and most environments.
	84		X			IC	When ultimate protection is required for carbon or graphite items.
Paper	47			X		III	Protection required against physical damage (other than water).
	48		X			IC	Protection required against water damage.
Wood or cork	49			X		III	Protection required against physical damage (other than oil, water and moisture).
	50		X			IC	Protection required against oil or water.
Cordage and items made of cloth	51			X		III	Items chemically treated provide protection against insects, decay organisms and bacteria damage.
	52		X			IC	Items not chemically treated.
Textiles	53		X			IC	Protection required against shrinkage, decay organisms, insects, sunlight or soiling.

1/ Group number refers to "Material and Finish" column of the Packaging Data Forms of MIL-STD-834.
2/ When a higher degree of protection is specified for the nonmetal, change method of packaging per requirement of the nonmetal present. Do not apply preservative or lubricant to nonmetallic materials.
3/ When the weight or size limitations of Method IC are exceeded, or the appropriate submethod of IC is not adequate, use the appropriate submethod of IA.

N/A - Not applicable.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE II. Determination of method of MIL-P-116 (Continued).

Complete electrical instruments, radio and radar sets, other communications equipment

Composition or Condition	Group No. 1/	Contact Preservative Prohibited	Has Critical Surfaces or Application	Has Non-Critical Surfaces	Has Movable Parts	Method of MIL-P-116	Notes
End product may contain any material	54	N/A				III	Items sealed require physical and mechanical protection only.

Radio and radar, other communications equipment sub-assemblies and component parts (not sealed)

Composition or Condition	Group No. 1/	Contact Preservative Prohibited	Has Critical Surfaces or Application	Has Non-Critical Surfaces	Has Movable Parts	Method of MIL-P-116	Notes
Steel, iron and magnesium	55	X		X		IC/IA	
	56	X	X			II	
	57	See Note	X		X	II	Functional lubricants not requiring removal prior to use will be applied as required.
Optical glass, quartz and mica	59	X	X			IC/IA	Includes plug type electronic connectors, resistors and capacitors. If moisture will affect operation, Method II shall apply.
Copper, bronze, brass, beryllium	60	X	X			IC/IA	
Gold, silver, platinum and iridium and other precious metals	61	X				IC/IA	
Parts move on bearings (any material)	62	X	X		X	II	

1/ Group number refers to "Material and Finish" column of the Packaging Data Forms of MIL-STD-834.

N/A - Not applicable

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE II. Determination of method of MIL-P-116 (Continued).

Radio and radar, other communications equipment subassemblies and component parts (not sealed) (Continued)

Composition or Condition		Group No. 1/	Contact Preservative Prohibited	Has Critical Surfaces or Application	Has Non-Critical Surfaces	Has Movable Parts	Method of MIL-P-116	Notes
Parts electrically balanced or calibrated	Bare steel, iron or magnesium	63	X			X	II	
	Other	64	X		X		IC/IA	Avoid excessive voids.
Metals that are varnished, lacquered, or given other equivalent protective coatings		65	X		X		III	Method III shall also apply for metals painted or enameled.
Metals which have parkerized, bonderized, blued, dichromate or black oxide finish over entire surface, includes nonmetallic combinations		66	X		X	X	IC/IA	Includes items to which a contact preservative could not be applied without injury or difficulty of removal.
		67	See Note		X	X	IC/IA	Functional lubricants not requiring removal prior to use may be applied.
Not made of bare steel, iron, or magnesium; not made of bare silver, copper, bronze, beryllium, optical glass, quartz or mica		68	X		X		III	Does not have inaccessible contact areas from which it would be difficult to remove corrosion products.

1/ Group number refers to the "Material and Finish" column of the Packaging Data Forms of MIL-STD-816.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE II. Determination of method of MIL-P-116 (Continued).

Instruments (non-electrical) or similar assemblies

Composition or Condition	Group No. 1/	Contact Preservative Prohibited	Has Critical Surfaces or Application	Has Non-Critical Surfaces	Has Movable Parts	Method of MIL-P-116	Notes
End product may contain any material (not sealed)	70	X		X		Note	Package according to material and finish. Critical internal surfaces protected by operational fluid.
	71		X			IC/IA	
	72		X			Note	Package according to material and finish at most critical external surface.
	73	X	X			II	
	85	X				IC/IA	Package to protect item against emt and esd damage (IA) and against esd damage only (IC).
End product may contain any material (sealed)	74					Note	Package according to material and finish at most critical external surface.

1/ Group number refers to "Material and Finish" column of the Packaging Data Forms of MIL-STD-834.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE III. Table for selecting weight and fragility category (Category for combinations of weights of item and fragility requirements).

Item weight (pounds) and dimensions	Degree of fragility	Category Code
2 lbs. or less, one dimension 2 inches or less, other dimensions less than 24 inches (see note 1)	Above 110 G's	A
2 lbs. or less, all dimensions over 2 inches but less than 24 inches (see note 2)	Above 110 G's	B
Over 2 lbs. to 5.0 lbs., all dimensions less than 24 inches	Above 110 G's	C
Over 5.0 lbs. to 7.5 lbs., all dimensions less than 24 inches	Above 110 G's	D
Over 7.5 lbs. to 10.0 lbs., all dimensions less than 24 inches	Above 110 G's	E
0.25 lbs. or less, one dimension 2 inches or less, other dimensions less than 24 inches	85 to 110 G's	F
Over 0.25 lbs. to 2.0 lbs., one dimensions 2 inches or less, other dimensions less than 24 inches	85 to 110 G's	G
2 lbs. or less, all dimensions over 2 inches but less than 24 inches	85 to 110 G's	H
Over 2 lbs to 5.0 lbs., all dimensions less than 24 inches	85 to 110 G's	J
Over 5 lbs. to 7.5 lbs., all dimensions less than 24 inches	85 to 110 G's	K
Over 7.5 lbs. to 10 lbs., all dimensions less than 24 inches	85 to 110 G's	L

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE III. Table for selecting weight and fragility category (Category for combinations of weights of item and fragility requirements) (Continued).

Item weight (pounds) and dimensions	Degree of fragility	Category Code
Over 10 pounds regardless of dimension	Any degree of fragility	Z
Any weight and one dimension exceeding 24 inches	Any degree of fragility	Z
Any weight, any dimension	Less than 85 G's	Z

Note 1. Items which have irregularities or protrusions which require cushioning to protect the package shall be coded F or G.

Note 2. Items which have irregularities or protrusions which require cushioning to protect the package shall be coded H.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE IV. Table for selecting preservative category.

(Select the preservative in accordance with MIL-P-116)

Applicable Preservative Material Used	Category Code	Corresponding MIL-STD-726 Code
No requirement	Ø	ØØ
P-1	A	Ø1
P-2	B	Ø2
P-6	C	Ø6
P-9	D	Ø9
P-10	E	1Ø
P-11	F	11
P-14	G	14
P-15	H	15
P-17	I	17
P-18	J	18
P-19	K	19
MIL-H-6083 Hydraulic Preservative	L	62
MIL-L-7870 Lubricating Oil, Gen Purpose, Low Temp.	M	5Ø
Special requirement or not listed above	Z	ZZ

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE V. Examples of corresponding coded packaging data.

MIL-P-116 Method of Preservation	Weight/ Fragility Code	Preservative Selection Code	Predetermined Packaging Code (First 13-digit positions)
III	A	0	10_10000000A1
	B	0	10_10000000ED
	C	0	10_10000NAAED
	D	0	10_10000NABED
	E	0	10_10000NACED
	F	0	10_10000NAAA1
	G	0	10_10000NABA1
	H	0	10_10000NABED
	J	0	10_10000NACED
	K	0	10_10000NADED
	L	0	10_10000NAFED
IA	A	A	3G_101GF000XX
	A	B	3G_102GF000XX
	A	J	3G_118GF000XX
	B	A	3P_101GF000XX
	B	B	3P_102GF000XX
	B	J	3P_118GF000XX

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE VI. Formulas for "bill of materials" determination.

Material weight and size requirement	Formula
Wrap	
a. Compute size of wrap in inches by: Note: LW = length wrap; LI = length item WW = width wrap; WI = width item WWT = wrap weight factor; HI = height item	a. LW = 2WI + 2HI + 2" WW = LI + HI + 1.5"
b. Compute weight of wrap in pounds by: WtW = weight of wrap	b. WtW = LW x WW x WWT (factor in/lbs)
Cushioning*	
c. Use formula 1 for roll cushioning in inches	c. Roll Cushioning Formula 1 LC = WI x NoT + 2HI x NoT + 1 x NoT WC = LI + HI + 1 x NoT TC = thickness of layer
NOTE: WC = width of cushioning LC = length of cushioning TC = thickness of cushioning NoT = number of thicknesses	
d. Use formula 2 for cut cushioning determination in inches	d. Cut Cushioning Formula 2 (BP) bottom and (TP) top pads = LBP = LI WBP = WI + 2TC TBP = TC
NOTE: LBP = length bottom pad WBP = width bottom pad TBP = thickness bottom pad	

*Item dimensions in this formula must include all wraps, dunnage and containers already applied to the item.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE VI. Formulas for "bill of materials" determination (Continued).

Material weight and size requirement	Formula
NOTE: EP = end pad SP = side pad LEP = length end pad WEP = width end pad TEP = thickness end pad LSP = length side pad WSP = width side pad TSP = thickness side pad	 (EP) end pads = LEP = WI = 2TC WEP = HI + 2TC TEP = TC (SP) side pads = LSP = LI WSP = HI TSP = TC
e. Compute weight of cushioning in pounds	e. Formula 1
NOTE: WtC = weight cushioning LC = length cushioning CD = cushioning density	WtC = LC x WC x TC x CD WtC = wt. in lbs.
f. Compute weight of cushioning in pounds	f. Formula 2 WtC = [2 (LBP x WBP) + 2 (LEP x WEP) + 2 (LSP x WSP)] x TG x CD WtC = wt. in lbs.

*Item dimensions in this formula must include all wraps, dunnage and containers already applied to the item.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE VI. Formulas for "bill of materials" determination (Continued).

Material weight and size requirement	Formula
Unit container	
g. Compute inside dimensions of container in inches by: NOTE: ILC = inside length containers IWC = inside width containers IHC = inside height containers	g. ILC = LI + 2TC IWC = WI + 2TC IHC = HI + 2TC
h. Compute outside dimensions of container in inches by: OLC = outside length container OWC = outside width container OHC = outside height container TF = thickness factor	h. OLC = ILC + 2TF OWC = IWC + 2TF OHC = IHC + 2TF + thickness of skids (+4 TF for RSC fiberboard)
i. Compute weight of container in pounds by: Wt Con = weight of container	i. Wt Con = no. of fiberboard boxes x 2 x fiberboard wt. factor (lbs./sq. in.) (ILC x IWC) + (ILC x IHC) + (IWC x IHC) (+1/2 flap area) + no. of skids x wood wt. factor (lbs./sq. in.) x skid thickness x skid width x skid length + no. of sleeves x 2 x fiberboard wt. factor [(ILC x IHC) + (IWC x IHC)]
j. Compute flexible barrier in inches by the following formula:	j. Method II a. Measure length of the item or container b. Measure width of the item or container c. Measure depth of the item or container 1. Length of barrier equals 2 times width, plus 2 times depth, plus 5 inches (or 3 inches) 2. Width of barrier equals length of the item plus depth, plus 3 inches for one heat seal (or 5 inches for 2 heat seals) Multiply totals of 1 and 2 together; divide by 144 to arrive at number of square ft. of area of barrier

TABLE VI. Formulas for "bill of materials" determination (Continued).

Material weight and size requirement	Formula
k. Compute flexible barrier size LB = length of barrier WB = width of barrier W = width of item to be enclosed L = length of item to be enclosed D = depth of item to be enclosed NOTE: a. Minimum size bag shall be 2-1/2 x 3 inches regardless of Formula b. After the size has been calculated, extend the dimension of the width to the nearest inch, except for minimum size bag c. Bag sizes may be adjusted to adequately contain items when automatic packaging equipment is utilized 1. Compute quantity of desiccant for Method II packs using barrier material (1 unit = 1 ounce)	k. Method IC and IA a. Measure length of the item or container b. Measure width of the item or container c. Measure depth of the item or container 1. Length of barrier equals 2 times width plus 2 times depth plus 3 inches LB = 2W + 2D + 3 inches 2. Width of barrier equals length plus depth plus 3 inches WB = L + D + 3 inches 1. $U = CA + X_1D + X_2D + X_3D + X_4D$ desiccant computation by U = ~~units~~ of desiccant C = 0.011 when the area of the barrier is in sq. in. C = 1.6 when area is in sq. ft. A = area of barrier material (sq. in. or sq. ft.) X_1 = 8 for cellulosic material (including wood) and other materials not otherwise categorized X_2 = 3.6 for bound fibers (synthetic fiber or vegetable fibers bound with rubber) X_3 = 2 for glass fibers

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE TECHNICAL LIBRARY ABBOTTAEROSPACE.COM

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE VI. Formulas for "bill of materials" determination (Continued).

Material weight and size requirement	Formula
	X_4 = 0.5 for synthetic foams and rubber D = pounds of dunnage (other than metal) within the barrier
m. Compute quantity of desiccant for Method II packs using metal containers	m. $U = KV + X_1D + X_2D + X_3D + X_4D$ U = units of desiccant K = 0.0007 when the volume is in cubic inches K = 1.2 when the volume is in cubic feet V = volume within the barrier in cubic inches or cubic feet X_1 = 8 for cellulosic material (including wood) and other materials not otherwise categorized X_2 = 3.6 for bound fibers (synthetic fibers or vegetable fibers bound with rubber) X_3 = 2 for glass fibers X_4 = 0.5 for synthetic foams and rubber D = pounds of dunnage (other than metal) within the barrier

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE VII. Exterior container selection guide.

PPP-B-636 (Type 1 or 2 Loads)
Boxes, Shipping, Fiberboard (Solid & Corrugated)

Class Domestic

Grade	Variety	Combined Dimensions	Weight Limit (Lbs)
125	SW	40	20
175	SW	60	40
200	SW & DW	75	65
275	SW & DW	90	90
350	SW & DW	100	120
500	DW	110	140
600	DW	120	160

Class Weather-resistant

Grade	Combined Dims (Inches)	Weight Limit (Lbs)
W6s & W6c	30	30
W5S & W5c	75	65
V3s, V4s & V3c	90	90
V15c	90	90
V2s	100	120
V13c	100	120
V11c	120	160

PPP-B-640 (Type 1 or 2 Loads)

Boxes, Fiberboard, Corrugated, Triple-Wall

Class 1 & 2 Weight Limit (Lbs) 350

PPP-B-591 (Type 1 or 2 Loads)
Boxes, Shipping, Fiberboard, Wood-cleated
Style A & B

Class 1 Domestic

Grade	Type	Weight Limit (Lbs)
200	SF, CF (SW)	75
275	SF, CF (SW)	150
300	SF, CF (SW)	225
350	SF, CF (SW)	300
375	SF	400
400	SF, CF (SW)	400

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE VII. Exterior container selection guide (Continued).

PPP-B-591 (Continued)
Class 2 Weather-resistant

Max. size	Type	Weight Limit (Lbs)
4' x 3' x 3'	SF	200

PPP-B-585

Boxes, Wood, Wirebound

Class	Weight Limit (Lbs)
1 - Domestic	500
2 - Normal Overseas	400
3 - Military Overseas	300

PPP-B-576

Boxes, Wood, Cleated, Veneer, Paper Overlaid

Class	Weight Limit (Lbs)
1 - Domestic	400
2 - Overseas	350

PPP-B-601

Boxes, Wood, Cleated-Plywood (Style A and B)

Type	Weight Limit (Lbs)
Domestic	1000
Overseas	1000

PPP-B-621

Boxes, Wood, Nailed and Lock-Corner

Class	Weight Limit (Lbs)
1 - Domestic	400
2 - Overseas	600

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE VIII. Approximate fragility factors.

15 G's or less

Some accelerometers and inertial guidance platforms.

15 - 24 G's

Missile guidance systems, precision aligned test equipment, gyros, some inertial guidance platforms, some altimeters.

25 - 39 G's

Mechanically shock-mounted instruments (shock mounts secured prior to packaging provided for in-service use only), vacuum tube electronics equipment, some altimeters.

40 - 59 G's

Aircraft accessories such as constant speed drives; electric typewriters, most solid state electronics equipment, oscilloscopes, computer components.

60 - 84 G's

TV receivers, aircraft accessories such as generators, starters; some solid-state electronics equipment, some circuit cards and some terminal boards.

85 - 110 G's

Refrigerators, appliances, some electromechanical equipment, some circuit cards, air duct hoses, attenuators, cable assemblies, some capacitors, gears, housings, receivers, couplers, some resistors, some terminal boards.

110 + G's

Machinery, aircraft structural parts such as landing gears, control surfaces, hydraulic equipment, washers, latch pins, plates, screw brackets, bushings, gaskets, cable assemblies, some capacitors, coupling cover drive discs, fittings, some resistors, rings, rollers, shafts, supports.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

THIS PAGE INTENTIONALLY LEFT BLANK

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

APPENDIX E

PACKAGING OF KITS (PARTS AND MODIFICATION)

10. Scope.

10.1 This appendix covers the packaging of parts kits and modification kits.

20. Preservation. Level A, B, and C or industrial preservation shall be as specified by the acquiring agency for all items within the kits, including Government furnished property (GFP) or spare parts (to be assembled into kits).

20.1 Consolidation of different items within a method or submethod of preservation. Items of different physical characteristics may be consolidated within the same method or submethod of preservation under the following circumstances:

20.1.1 The items to be consolidated are all part of the same individual kit.

20.1.2 The method of preservation shall afford adequate protection to the most critical item contained therein.

20.1.3 The area of the protective barrier shall not be increased by the addition of noncritical items to the extent that the package life will be shortened due to the increase in moisture vapor transmission or that a substantial increase in desiccant will be required.

20.1.4 Items of a delicate nature shall not be subjected to damage from rugged items contained within the same package.

20.1.5 Noncritical items of odd shapes or having sharp protrusions will not tend to damage protective barriers.

20.1.6 Items of dissimilar metals subject to damage from electrolytic action are to be insulated with suitable material to prevent forming of galvanic cells.

20.1.7 Antifriction bearings, associated parts (races, balls and rollers) and subassemblies which are components of repair and overhaul kits shall be prepared for shipment in accordance with the requirements of MIL-B-197.

20.1.8 Use of hygroscopic cushioning or dunnage material shall be held to a minimum. Newsprint or excelsior shall not be used. Loose fill expanded polystyrene shall not be used for material to be delivered to the Navy.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

20.1.9 Shims, gaskets and items of delicate or fragile nature shall be afforded protection in the form of cushioning, die-cut dunnage, fiberboard supports, fiberboard sandwiches, etc., to ensure shape and serviceability are maintained.

20.2 Application of preservative compounds or oils.

20.2.1 Kits procured for oxygen equipment. A preservative compound or oil shall not be applied to any item that may come into contact with oxygen.

20.2.2 Preservation procedures. All items are to be thoroughly cleaned and dried in accordance with MIL-P-116 before application of preservative compounds or oils. In no instance shall a preservative compound or oil be applied over a protective grease or oil.

20.2.3 Items susceptible to corrosion (iron, steel, magnesium, etc.). A preservative compound or oil will be applied unless harmful to the item. Preservative compounds are preferred; however, preservative oils may be used when compounds are difficult to remove, or are not feasible due to size configuration or application of the item.

30. Unit preservation.

30.1 Physical protection. Methods of preservation when necessary for physical protection shall be supplemented by cushioning, wraps, and containers of the minimum size and weight to afford such protection.

30.2 Segregation of items within packs. Care will be used to ensure that items, which have been segregated due to similar characteristics wherein identification by visual observation would be difficult, are kept segregated and individually identified. Also, it is normally desirable to segregate components or two related repairable assemblies within the kit. For example, components relating to the pump shall not be intermingled with components relating to the motor. Segregation of items within a kit shall be accomplished by wraps, bags, boxes, dividers, container separations, tubes, skin or blister packs or other approved media.

30.3 Skin packaging. When skin packaging is used for kits, provisions shall be incorporated into the design layout for folding whereby the size of the skin pack can be reduced to a compact unit pack. This may be accomplished by slotting, scoring, creasing, perforating or other comparable method.

30.3.1 Skin packaging metals. Segregated preserved and unpreserved metal items shall be wrapped with a greaseproof or neutral barrier, respectively, unless the skin packaging material, ink, and backing board in contact with the item is certified as noncorrosive or greaseproof as applicable.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

30.3.2 Skin packaging shims, gaskets, etc. When skin type packaging is used on items such as thin shims, paper gaskets, etc., that cannot be removed without damage to the item due to a shrink film bonding the item to the backing board, the item shall be placed in a bag or other suitable protective media prior to film application to provide ease of removal.

40. Packing. Exterior shipping containers shall conform to level A, B, C or industrial requirements of this standard as specified in the contract or order.

50. Industrial packaging. Unless otherwise specified by the acquiring agency, kits shall be packaged in accordance with MIL-STD-1188.

60. Marking and identification.

60.1 Shipping containers. Unit, intermediate and shipping containers shall be marked and identified according to MIL-STD-129. When a kit is composed of more than one shipping container, the same items shall always be packed in the same numbered box.

60.2 Hazardous materials. All interior packs and shipping containers for materials regulated as hazardous under title 49 CFR, or AFR 71-4/DLAM 4145.3/TM 38-250/NAVSUP PUB 505/MCO P4030.19 shall be marked, regardless of exemption for mode of transportation, with proper shipping name of the item, flash point of all liquids having a flash point below 200°F and percentage concentration of acids and corrosive liquids.

60.3 Additional marking. Additional marking and identification may be required to identify parts, unitized packs, and consolidated items. Set markings such as 1 of 3, 2 of 3, 3 of 3, etc. of MIL-STD-129 shall apply when the kit is composed of more than one shipping container.

60.3.1 Nonconsolidated items. Items which do not lend themselves to consolidation shall be identified with a sequential or segregation number.

60.3.2 Individually packed items. When the method of preservation requires the items to be individually packed, the unit container shall be identified by a sequential or segregation number.

60.3.3 Unitized items. Each unitized or consolidated group of items shall be identified with a sequential or segregation number.

60.3.4 Skin packs. When skin packs are used, each item or unitized like items shall be identified by sequential numbers. The numbers shall be placed on the backing board in such a manner as to prevent smudge, smear, or fade-out when skin covering is applied.

60.3.5 Kit contents list. A list of all items in each kit shall be prepared in accordance with Figure 1 of this appendix and shall be included as part of identification and marking with each kit. Alternate

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

form of the kit list format, such as that shown in MIL-STD-129 or contractor's own format is permissible provided all essential elements are reflected. For kits containing any item of hazardous material, one copy of Figure 1 of this appendix shall be forwarded by mail direct to the acquiring activity annotated as follows (for each hazardous item): The proper shipping name of the item; flash point of all liquids having a flash point below 200°F (94.33°C); boiling point of flammable and combustible liquids if the flash point is less than 73°F; radioactive isotope and quantity.

60.3.5.1 Contents list of skin-packaged kits. For skin-packaged kits, the kit contents list shall be on the backing board. Space and readability permitting, lists may be on the face of the backing board. Only when space does not permit will lists be located on the back of the skinned package. In such instances, label cement (MMM-A-178) shall be used in securing these lists.

70. Instructions for completion of kit contents list.

Block 1 Show the assigned National Stock Number, or other official identifying number for the kit.

Block 2 Show the assembly(s), component(s), or item(s) on which the parts in the kit will be used. Show noun name, design activities' Federal Supply Code for Manufacturer (FSCM), and part number(s) and National Stock Number (NSN).

Block 3 Show name of contractor furnishing the kits and the contract number.

Block 4 Show date of preparation of the kit.

Block 5 Show total number of segregated packages.

Block 6 Show total number of line items in the kit. This is the total of all entries under block 10.

Block 7 Show the assigned special packaging drawing number when applicable.

Block 8 Show number of pages required for the list - (1 of 2).

Block 9 Show in sequence the number or letter assigned to each segregated package, group, container, or section. Opposite this entry, enter a dash (----) in the column under blocks 10 and 11.

Block 10 Show design activity part number. Identify part number for each item within a segregated package, group or section. If an item appears on or is included in more than one segregated package, group, or section, the part number for that item shall be repeated in each location.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

Block 11 Show noun or name of each item listed under block 10.

Block 12 Show the quantity of each item listed under block 11. Also, opposite each entry under block 9, show the total quantity of items in each segregated package, group, or section.

Block 13 Show the method of preservation for each segregated package, group or section, identified by an entry under block 9.

Block 14 Remarks. (This must include, but is not limited to, detailed information for hazardous materials required by 60.2.)

FIGURE 1. Kit contents list.

National Stock Number 1		Application 2		Contractor Contract No. 3	Date 4
Number Segregated Packages 5		Total Items in Kit 6		Assigned Special Packaging Drawing No. 7	Number of Pages 8
Assigned Segregated Package Number 9	Design Activity Part Number for Item 10	Noun Name of Each Item 11	Quantities of Items 12	Method of Preservation for Each Segregated Package 13	Remarks 14

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE TECHNICAL LIBRARY

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

APPENDIX F

FACTORS AND FORMULAE ESTABLISHING QUP

10. Scope. This appendix provides the methods to determine the quantity per unit pack (QUP) for other than hazardous materials, when same is not specified in an applicable commodities specification. QUP for hazardous material shall be determined after consideration of the users needs and the restrictions of title 49 CFR.

20. Determination of QUP.

20.1 Repairable items. The QUP of one will be established for all items identified as repairable.

20.2 Consumable items.

a. QUP shall be one for consumable items with a unit cost of $50.00 or more.

b. Items of less than $50.00 unit cost may be assigned a QUP of greater than one (1) when the computation utilizing Formula A or B so indicates. However, the maximum dollar value of the QUP shall not exceed $200.00 for parts applicable to more than one assembly or $100.00 for parts applicable to only one assembly.

20.3 Irregular configuration, delicate or fragile item. The QUP for items of irregular configuration, delicate or fragile nature, not lending themselves to multiple packs, is one each.

20.4 Pairs, sets, etc. items. The QUP for items which are furnished in pairs, sets, etc., is one pair, one set, etc., as applicable.

20.5 Items unit packed in accordance with Method II. The QUP for items which are unit packed in accordance with Method II of MIL-P-116 shall be one.

20.6 Kit. A kit will be indicated one each, regardless of the quantity of items contained therein.

20.7 Lumber, raw stock, paints, oils, dope, etc. The factors and formulas contained herein are not applicable to lumber, raw stock, paints, oils, dope, etc. QUP in these instances will be outlined in the contract.

20.8 Factors and formulae establishing QUP. The following factors and formulae should be used by contractors and item managers for determining the quantity per unit pack (QUP).

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

20.8.1 Formula A:

a. Determine item unit cost. Assign cost factor rate shown in the table and follow column down selecting appropriate rate from group of factors (Groups I through IV).

b. The final rating score is the total computation of the rates from Groups I through IV.

c. Determine whether item is applicable to more than one end assembly or applicable to only one end assembly. The correct QUP will be the number in the appropriate column in the summary of factors horizontal to the final rating score referenced in (b) above.

d. For consumer items, office supplies, clothing, commercial hardware, and similar items, a third "quantity" column may be added in the summary to effect uniformity and compatibility with standar commercial packaging. This additional column will not necessitate changing any factors in any of the tables, including the final rating score.

e. Delicate or fragile peculiar parts costing $2.50 or less, with a final rating score of five or more and similar common parts with a final rating score of four or more will be afforded the next lesser QUP rather than that normally specified in the summary.

f. In determining QUP for those items or classes for which actual use factors and replacement factors are not available, estimated factors will be used, and the appropriate numerical rate assigned.

20.8.2 Formula B:

a. Determine quantity required per end assembly. Assign factor rate shown in the table and follow column down selecting appropriate rate from each group of factors (Groups I through IV).

b. The final rating score is the total computation of the rates from Groups I through IV

c. Determine whether item is applicable to more than one end assembly or applicable to only one end assembly. The correct QUP will be the number in the appropriate column in the summary of factors horizontal to the final rating score referenced in (b) above.

d. In determining QUP for those items or classes for which actual use factors and replacement factors are not available, estimated factors will be used, and the appropriate numerical rate assigned.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

30. Quantity per unit pack determination formula

30.1 Formula A. (For consumer and maintenance type items only)*
(Includes items having both maintenance & overhaul application.)

	Cost per item in dollars					
	.01 to .50	.51 to 4.00	4.01 to 10.00	10.01 to 20.00	20.01 to 35.00	35.01 to 50.00
GROUP I - Cost factor rates	4	3	2	1	0	-2
Group II - Weight & cube factor rates						
0 to 0.01 cu. ft. and 0 to 0.01 lb.	2	2	2	2	2	2
0.02 to 1.00 cu. ft. and 0.02 to 1.00 lb.	1	1	1	1	1	1
1.01 to 2.00 cu. ft. and 1.01 to 2.00 lb.	0	0	0	0	0	0
2.01 to 3.00 cu. ft. and 2.01 to 5.00 lb.	-1	-1	-1	-1	-1	-1
Items exceeding 3.00 cu. & 5.00 lb. will be packaged in QUP of one each or one set.						
GROUP III - Replacement factor rates**						
1% thru 20%	-2	-2	-2	-2	-2	-2
21% thru 50%	-1	-1	-1	-1	-1	-1
51% or more	0	0	0	0	0	0
GROUP IV - Method of preservation factor rates						
Methods I and III	0	0	0	0	0	0
Method IC	-2	-2	-2	-2	-2	-2

Summary of Factors (Formula A)	Parts applicable to more than one assembly***	Parts applicable to only one assembly
0 or less	1	1
1	5	1
2	10	5
3	10	5
4	25****	10
5	50****	25
6	50****	50

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

30.2 Formula B - (For Code 3, overhaul items).

	Quantity required for end assembly			
	8 or Over	5 to 7	3 to 4	1 to 2
GROUP I - Quantity required per assembly factor rate	6	5	4	2
Group II - Weight & cube factor rates				
0 to 0.01 cu. ft. & 0 to .01 lb.	2	2	2	2
0.02 to 1.00 cu. ft. & 0.02 to 1.00 lb.	1	1	1	1
1.01 to 2.00 cu. ft. & 1.01 to 2.00 lb.	-5	-4	-4	-2
2.01 to 3.00 cu. ft. & 2.01 to 5.00 lb.	-6	-5	-5	-3
Items exceeding 3.00 cu. ft. & 5.00 lb. will be packed in QUP of one each or one set.				
GROUP III - Replacement factor rate				
1% thru 5%	-4	-4	-4	-4
6% thru 20%	-3	-3	-3	-3
21% thru 40%	-2	-2	-2	-2
41% thru 75%	0	0	0	0
76% thru 100%	+1	+1	+1	+1
GROUP IV - Method of preservation factor rate				
Method I and III	0	0	0	0
Method IC	-2	-2	-2	-2

Summary of factors (Formula B)	Parts applicable to more than one assembly	Parts applicable to only one assembly
0 or less	1	1
1	5	1
2	10	5
3	10	5
4	25	10
5	50	25
6	50	50
7	100	50
8	200	100*
9	500	

* Use QUP of 100 each only in instances where more than 100 each of an item is required per end assembly.

* 20.9.1 (d)
** 20.9.1 (f)
*** 20.9.1 (c)
**** 20.9.1 (e)

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

APPENDIX G

SELECTION OF MULTIAPPLICATION CONTAINERS

10. Scope. This appendix lists multiapplication containers and gives the information necessary to select the container which will protect a given item against physical damage. The basic preservation requirements are governed by Appendix D of this standard.

10.1 Application. The DOD packaging activity, contractor, subcontractor, or vendor shall select the appropriate multiapplication container for those depot reparable items which fall within the parameters of size, (allowing for the wrapping material and barrier) weight, and fragility given in Table I of this appendix. Although these integral containers are designed for the purpose of protecting fragile items (see Table VIII of Appendix D), the pack reusability, versatility, and low labor costs of insertion and removal of the item make it cost effective for many less fragile and nonreparable items.

20. General requirements.

20.1 Dynamic cushioning values Shock values of Table I of this appendix were determined by instrumented free-fall drop testing in accordance with Method 5007 of FED-STD-101. Table I of this appendix, Multiapplication Container Selection, is based on maximum item dimensions and a range of item weights which correspond to a range of dynamic cushioning values for the given size of containers.

20.2 Item size range. The versatility of the multiapplication container, that is, the large number of items (identified individually by NSN) which can be packed in one type and size, is made possible by design of the cushion insert. The range of item dimensions results from precompression of the star-shaped cushion cavity or of the fingers of the convoluted foam without adversely affecting the dynamic cushioning properties. Items which do not fill the cushion cavity sufficiently to provide a firm grip on the item and which are shorter than the length of the cavity shall be prevented from moving by filling the void with any cushioning material compatible with the item and the foam. Items whose dimensions exceed the maximum will precompress the cushioning more than normally and thus increase the shock input. This is an important consideration when item dimensions exceed the recommended maximum.

20.3 Techniques to assure preservation/item integrity. The following techniques, based on shipping experiences, are derived from MIL-P-116.

20.3.1 Barrier rupture. Items preserved by methods requiring closed or sealed barriers shall be wrapped (with corners and protuberances cushioned, if need be) to prevent barrier rupture.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

20.3.2 Stress areas. Items with handles, knobs, or other protrusions shall be wrapped or otherwise protected and secured to facilitate equal distribution of shock forces over entire surface of the item and thus prevent damaging shock forces to the protrusions.

20.3.3 Desiccant placement. When desiccant is required, the bags shall be placed so that they are not load bearing. If this is not possible, cloth bags shall be used and possible stress on the bags shall be relieved by placement of cushioning or dunnage as above. Desiccant shall not be placed in direct contact with the item. When desiccant is to be placed next to a metal surface, the desiccant shall be insulated from the metal surface by placing a piece of MIL-B-121, Grade A barrier material between the two.

30. Detail requirements.

30.1 Type and use. Construction details and material requirements for Types I through IV (Fast Packs) shall conform to PPP-B-1672. Type VI through VIII shall be in accordance with the cognisant Government design activity requirements or drawing; i.e., Type VI shall conform to Naval Aviation Supply Office (ASO) drawing P069, Type VII to ASO drawing 13414 and Type VIII to ASO drawing 15024, respectively.

30.1.1 Type I. Consists of a polyurethane foam cushion insert with a diecut, star shaped, vertical cavity and top and bottom pads of the same material assembled in the container. Type I is used for packaging fragile items, either rectangular or cylindrical in shape, such as meters, gauges, attitude and air speed indicators. Items packaged in this star pack type are inserted (loaded) into the cavity from the top of the container prior to placing the top pad in place.

30.1.2 Type II. Consists of folding convoluted polyurethane foam cushion bonded to container board. Although the cushioning provides protection against shock, it essentially holds the item in place by precompression of the convoluted tips. Type II is used for circuit boards and electronic modules. It is also used for packing glass envelope electronic tubes or other items whose depth does not exceed the limits shown in Table I of this appendix.

30.1.3 Type III. Consists of a telescoping container with bonded convoluted (some end and side pads are flat sheet stock) polyurethane foam cushioning which forms an oblong cavity. Type III is used to pack equipment such as receiver-transmitters, amplifiers, power supply units, and electronic indicators.

30.1.4 Type IV. Consists of a two piece (top and bottom) polyurethane foam insert, which forms a star shaped cavity when the two pieces are mated in conjunction with end pads of flat sheet stock. The insert components and end pads are bonded in place in a half telescoping container conforming to PPP-B-636, Type CF, Style DBLCC. The cushioning

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

insert is similar to the Type I star pack insert except that it is cut along (horizontal to) its greatest dimensional length to facilitate insertion (loading) and extraction of relatively long, rectangular or cylindrical items such as voltage regulators, electronic receivers, panels, transmitters, couplers and amplifiers.

30.1.5 Type VI. Consists of two halves of polyethylene blow molded container with polyurethane cushioning and a static free cushioned bag. This is used to ship circuit cards and similar type components.

30.1.6 Type VII. Consists of a plastic type container with bonded convoluted polyurethane foam cushioning which forms a cavity.

30.1.7 Type VIII. Consists of plastic type container with a coiled steel cable shock mounted platform to which is strapped highly sensitive equipment.

30.2 Identification of multiapplication containers. All multiapplication containers are assigned NSNs. (See Table I of this appendix.)

30.3 Coded data. MIL-STD-726 provides codes to identify each type of container. This code, plus dimensions, completely specifies the type and size of pack in acquisition documents.

30.4 Packaging design validation (See Appendix C). The validation of multiapplication container selection is as follows:

a. Items which meet the weight, dimension, and fragility factor of Table I of this appendix do not require design validation.

b. If fragility factor is unknown but is estimated to be within the ranges specified in Table VIII of Appendix D, rough handling tests shall be performed to confirm the selection of a given container from Table I of this appendix.

c. If fragility factor is unknown but is estimated to be different than that specified for similar items in Table VIII of Appendix D, validation shall be accomplished to confirm the selection made from Table I of this appendix.

EXAMPLE: Item in the 15-24 G grouping of Table VIII of Appendix D selected for a 25-29 G Pack of Table I of this appendix.

d. If fragility factor is unknown but estimated to be more fragile than similar items in the applicable approximate fragility grouping in Table VIII of Appendix D, validation of the pack selected shall be accomplished or a rationale with specific justification shall be provided for the selection of a more protective container from Table I of this appendix.

EXAMPLE: Item normally in the 40-59 G grouping of Table VIII of Appendix D estimated to have a 20-24 fragility.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

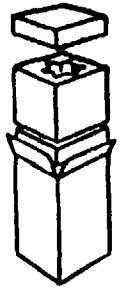


TABLE I. Multiapplication container selection.

PPP-B-1672, Type I, vertical star (MIL-STD-726, Code NR)

Container ID (in.) (National Stock Number)	Recommended max. bare item dimensions (in.)	Range item weight (lbs.)	Maximum shock (G's) transmitted to item
6 x 6 x 10 (8115-00-192-1603)	3 Dia x 6	1.0 - 1.5	30 - 40
		1.6 - 2.25	25 - 29
		2.3 - 3.0	30 - 40
	3 x 3 x 6	1.5 - 4.0	30 - 40
8 x 8 x 12 (8115-00-192-1604)	3 x 3 x 8	1.5 - 4.0	30 - 40
	4 Dia x 8	3.0 - 7.5	25 - 29
		7.6 - 8.5	30 - 40
	4 x 4 x 8	3.0 - 5.0	25 - 29
		5.1 - 7.0	30 - 40
	5 Dia x 8	3.5 - 5.5	30 - 40
10 x 10 x 12 (8115-00-192-1605)	4 Dia x 6	2.0 - 3.0	30 - 40
		3.1 - 4.5	25 - 29
		4.6 - 5.0	30 - 40
	5 Dia x 6	3.0 - 6.0	30 - 40
	6 Dia x 6	4.5 - 7.0	30 - 40
	5 x 5 x 6	4.0 - 9.0	30 - 40
12 x 12 x 14 (8115-00-134-3655)	5 Dia x 8	3.5 - 4.5	25 - 29
		4.6 - 8.5	20 - 24
	6 Dia x 8	5.0 - 7.0	25 - 29
		7.1 - 13.0	20 - 24
	5 x 5 x 8	3.0 - 5.0	30 - 40
		5.1 - 7.0	25 - 29
		7.1 - 11.0	20 - 24
	6 x 6 x 8	5.0 - 7.0	30 - 40
		7.1 - 10.0	25 - 29
		10.1 - 12.0	20 - 24

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

40. Availability.

40.1 General Services Administration (GSA). Types I through IV (Fast Packs) are stocked by GSA (Federal Supply Service). DOD and Federal Agencies may obtain them from GSA by MILSTRIP and FEDSTRIP procedures. When authorized by the administrative contracting officer and with concurrence of the GSA regional office affected, Government contractors may buy direct from GSA. The Government may also elect to supply these packs to contractors as Government furnished property.

40.2 Aviation Supply Office. Types VI through VIII are stocked by the Aviation Supply Office. DoD and Federal Agencies may obtain them from ASO by MILSTRIP and FEDSTRIP procedures. The Government may also elect to supply these packs to contractors as Government furnished property.

40.3 Commercial sources. Suppliers of the multiapplication containers are located nationwide. Names of these suppliers are available from the Contract Administration Activity.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE I. Multiapplication container selection (Continued).

PPP-B-1672, Type I, vertical star (MIL-STD-726, Code NR)

Container ID (in.) (National Stock Number)	Recommended max. bare item dimensions (in.)	Range item weight (lbs.)	Maximum shock (G's) transmitted to item
12 x 12 x 18 (8115-00-050-5237)	5 Dia x 10	4.0 - 5.0	25 - 29
		5.1 - 11.0	20 - 24
	6 Dia x 10	6.0 - 8.0	25 - 29
		8.1 - 16.0	20 - 24
	5 x 5 x 10	4.0 - 6.0	30 - 40
		6.1 - 8.0	25 - 29
		8.1 - 13.0	20 - 24
	6 x 6 x 10	8.0 - 10.0	30 - 40
		10.1 - 14.0	25 - 29
		14.1 - 20.0	20 - 24
14 x 14 x 16 (8115-00-134-3656)	6 Dia x 10	6.0 - 15.0	25 - 29
	7 Dia x 10	8.0 - 14.0	20 - 24
		14.1 - 17.0	24 - 29
		17.1 - 20.0	30 - 40
	6 x 6 x 10	5.0 - 7.0	30 - 40
		7.1 - 9.0	24 - 29
		9.1 - 12.0	20 - 24
	7 x 7 x 10	6.5 - 9.0	30 - 40
		9.1 - 12.0	25 - 29
		12.1 - 21.0	20 - 24
		21.1 - 23.0	25 - 29

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

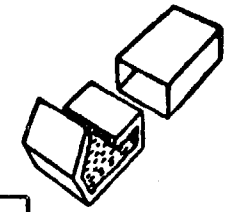


TABLE I. Multiapplication container selection (Continued).

PPP-B-1672, Type II, folding convoluted (MIL-STD-726, Code NS)

Container ID (in.) (National Stock Number)	Recommended max. bare item dimensions (in.)	Typical item weight (lbs.)	NOTE: Because items assigned to these packs are not fragile dynamic cushioning values have not been determined.
6 x 5 x 2-1/2 (8115-00-787-2142)	5 x 4-1/2 x 1-1/4	0.5	
6 x 5 x 3-1/2 (8115-00-787-2147)	5 x 4-1/2 x 2-1/4	1.0	
9 x 6 x 2-1/2 (8115-00-101-7647)	8 x 5-1/2 x 1-1/4	0.9	
9 x 6 x 3-1/2 (8115-00-101-7638)	8 x 5-1/2 x 2-1/4	1.8	
10 x 10 x 3-1/2 (8115-01-057-1244)	9 x 9-1/2 x 2-1/4	1.8	
12 x 8 x 2-1/2 (8115-00-787-2146)	11 x 7-1/2 x 1-1/4	1.8	
12 x 8 x 3-1/2 (8115-00-787-2148)	11 x 7-1/2 x 2-1/4	3.6	
13 x 13 x 3-1/2 (8115-01-057-1243)	12 x 12-1/2 x 2-1/4	4.3	
16 x 16 x 3-1/2 (8115-01-057-1245)	15 x 15-1/2 x 2-1/4	8.6	
18 x 12 x 2-1/2 (8115-01-019-4085)	17 x 11-1/2 x 1-1/4	4.3	
18 x 12 x 3-1/2 (8115-01-019-4084)	17 x 11-1/2 x 2-1/4	8.6	
24 x 16 x 3-1/2 (8115-01-093-3730)	23 x 15 x 2-1/4	10.0	

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

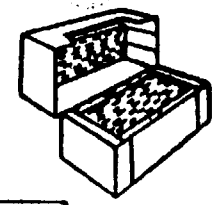


TABLE I. Multiapplication container selection (Continued).

PPP-B-1672, Type III, telescoping encapsulated (MIL-STD-726, Code NV)

Container ID (in.) (National Stock Number)	Recommended max. bare item dimensions (in.)	Range item weight (lbs.)	Maximum shock (G's) transmitted to item
30 x 16 x 14 (8115-00-516-0242)	24 x 11 x 9	28 - 48 49 - 54	30 - 39 40 - 50
32 x 12 x 14 (8115-00-519-1825)	26 x 6 x 8	12 - 20 20 - 29 30 - 33	30 - 39 25 - 29 40 - 50
26 x 9 x 9 (8115-01-015-1313)	20 x 5 x 5	20 (max.)	50 (max.)
24 x 14 x 14 (8115-00-550-3558)	18 x 8 x 8	13 - 16 17 - 38	30 - 39 25 - 29
20 x 14 x 9 (8115-00-516-0251)	16 x 10 x 5	6 - 7 7 - 8	30 - 39 40 - 50
25 x 14 x 14 (8115-00-550-3574)	13 x 7 x 7	7 - 14 15 - 16 17 - 19	20 - 24 30 - 39 40 - 50
32 x 18 x 16 (8115-01-015-1315)	24 x 13 x 11	80 (max.)	20 - 24
34 x 24 x 18 (8115-01-015-1314)	25 x 18 x 12	90 (max.)	35 (max.)
24 x 18 x 16 (8115-01-015-1312)	18 x 13 x 11	20 - 39 40 - 50	25 - 29 30 - 39
30 x 27 x 14 (8115-01-094-6520)	18 x 18 x 5	26 - 45 46 - 50	21 - 28 23 - 30

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

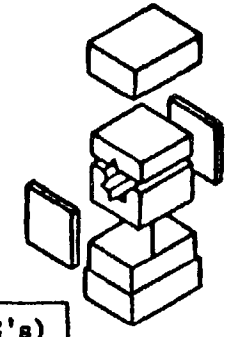


TABLE I. Multiapplication container selection (Continued).

PPP-B-1672, Type IV, horizontal stär (MIL-STD-726, Code NW)

Container ID (in.) (National Stock Number)	Recommended max. bare item dimensions (in.)	Range item weight (lbs.)	Maximum shock (G's) transmitted to item
20 x 14 x 14 (8115-01-010-8956)	14 x 5-3/8 x 5-3/8	6 - 14	25 - 29
		15 - 18	30 - 39
		19 - 21	40 - 50
	14 x 7 x 7	10 - 14	30 - 39
		15 - 19	20 - 24
		20 - 23	25 - 29
		24 - 26	30 - 39
		27 - 29	40 - 50
22 x 16 x 16 (8115-01-006-7257)	16 x 6-3/8 x 6-3/8	8 - 20	25 - 29
		21 - 27	30 - 39
		28 - 31	40 - 50
	16 x 7-1/4 x 7-1/4	11 - 16	25 - 29
		17 - 21	20 - 24
		22 - 24	25 - 29
		25 - 27	30 - 39
		28 - 31	40 - 50

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

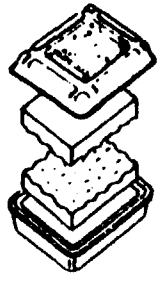


TABLE I. Multiapplication container selection (Continued).

Type VI, Molded Reusable Container Assy for Circuit Cards and Modules, Naval Aviation Supply Office Drawing No. P069 (MIL-STD-726, Code NY)

Container ID (in.) (National Stock Number)	*Recommended max. load size (in.)	Range item weight (lbs.)	
11.25 x 8.25 x 2.125 (8145-00-260-9556)	8.5 x 6.0 x 1.0	0 - 3	NOTE: Because items assigned to these packs are not fragile dynamic cushioning values have not been determined.
11.25 x 8.75 x 4.5 (8145-00-260-9548)	8.5 x 6.0 x 3.25	0 - 3	
13.25 x 10.75 x 2.125 (8145-00-260-9559)	10.5 x 8.0 x 1.00	0 - 4	
13.25 x 10.75 x 4.5 (8145-00-260-9562)	10.5 x 8.0 x 3.25	0 - 4	
6.75 x 5.0 x 2.0 (8145-01-014-0440)	5.0 x 3.0 x 1.0	0 - 2	
19.75 x 13.75 x 4.5 (8145-01-012-4088)	17.0 x 11.0 x 2.62	0 - 4	

*Includes wrap, barrier, bag, cushioned pouch and other packaging materials as required.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

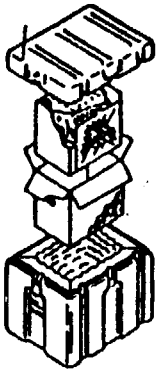


TABLE I. Multiapplication container selection (Continued).

Type VII, Modular Reusable Containers for Packaging Major Repairables, Naval Aviation Supply Office Drawing No. 13414 (MIL-STD-726, Code NZ)

Container ID (in.) (National Stock Number)	*Recommended max. load size (in.)	Range item weight (lbs.)	Maximum shock (G's) transmitted to item
10 x 10 x 14 (8145-00-301-2987)	4 x 4 x 8	6.0	40 - 50
10 x 10 x 18 (8145-00-288-1396)	4 x 4 x 12	7.0	40 - 50
14.5 x 13 x 10 (8145-00-553-1539)	8.5 x 7 x 4	9.0	40 - 50
14 x 14 x 12 (8145-00-519-6384)	8 x 8 x 6	11.0	40 - 50
12 x 12 x 18 (8145-00-288-1397)	6 x 6 x 12	11.0	40 - 50
20 x 13 x 12 (8145-00-485-8256)	14 x 7 x 6	17.0	40 - 50
16 x 16 x 15 (8145-00-522-6907)	10 x 10 x 9	20.0	40 - 50
18 x 14.5 x 19 (8145-00-449-8424	12 x 8.5 x 13	25.0	40 - 50
22.5 x 21 x 11.5 (8145-01-044-3289)	16.5 x 15 x 5.5	33.0	40 - 50
22 x 16 x 17 (8145-00-540-1762)	16 x 10 x 11	31.3	40 - 50
29 x 14.5 x 14 (8145-00-501-9138)	23 x 8.5 x 8	28.0	40 - 50

*Includes interior carton and associated blocking and bracing when applicable.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE I. Multiapplication container selection (Continued).

Type VII, Modular Reusable Containers for Packaging Major Repairables, Naval Aviation Supply Office Drawing No. 13414 (MIL-STD-726, Code NZ)

Container ID (in.) (National Stock Number)	*Recommended max. load size (in.)	Range item weight (lbs.)	Maximum shock (G's) transmitted to item
28 x 18 x 13 (8145-00-549-6647)	22 x 12 x 7	35.0	40 - 50
34 x 18 x 15 (8145-00-536-4925)	28 x 12 x 9	44	40 - 50
30 x 18 x 19 (8145-00-449-8427)	24 x 12 x 13	50	40 - 50
22.5 x 21 x 22.5 (8145-00-499-9808)	16.5 x 15 x 16.5	55	40 - 50
27 x 27 x 17 (8145-00-485-8250)	21 x 21 x 11	70	40 - 50
34 x 24 x 17 (8145-00-514-2798)	28 x 18 x 11	78	40 - 50
28 x 24.5 x 20.5 (8145-00-026-2369)	22 x 18.5 x 14.5	80	40 - 50
40 x 24 x 18 (8145-00-529-8585)	34 x 18 x 12	85	40 - 50
36 x 20 x 27 (8145-01-008-3683)	30 x 14 x 21	120	40 - 50
27 x 27 x 32 (8145-01-010-3776)	21 x 21 x 26	110	40 - 50

*Includes interior carton and associated blocking and bracing when applicable.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

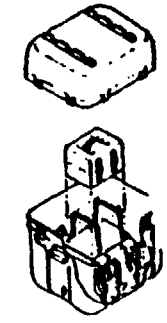


TABLE I. Multiapplication container selection (Continued).

Type VIII, Shipping and Storage Containers for Gyroscopic Instruments, Naval Aviation Supply Office Drawing No. 15024 (MIL-STD-726, Code MY)

Shipping container ID (in.) (National Stock No.)	*Max. load size without handling case (in.)	Handling case, OD (National Stock No.)	Item size using handling case	Item weight (lbs.)	Max. shock (G's) transmitted to item
30 x 26.38 x 25.5 (8145-01-016-3451)	13 x 9 x 8	10.38 x 6.5 x 6.5 (8145-01-016-3453)	max. lngth-8.38 max. width-4.5 depth min.-1.69 max.-3.75	0.5-10.5	15
		12.5 x 7.25 x 8 (8145-01-016-3454)	max. lngth-10.5 max. width-5.25 depth min.-3.25 max.-5.25		
		14 x 10.38 x 9.75 (8145-01-016-3455)	max, lngth-12 max. Width-8.38 depth min.-5 max.-7		
35 x 27 x 30 (8145-01-016-3452)	17.5 x 12.25 x 13	18 x 12.25 x 11.75 (8145-01-016-3456)	max. lngth-16 max. lngth-10.25 depth min.-6.9 max.-9	8-40	15
		19 x 14 x 14.25 (8145-01-016-3445)	max. lngth-17 max. width-12 depth min.-9.5 max.-11.5		

*Includes wrap and cushioning as required to protect the barrier bag when applicable.

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

THIS PAGE INTENTIONALLY LEFT BLANK

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

APPENDIX H

RECOMMENDED FIBERBOARD CONTAINER SIZE LIST

10. Scope. This appendix lists the most frequently used fiberboard container sizes in the packaging of parts delivered to the Government.

TABLE I. Recommended fiberboard container size list.

Container size inches (ID)	Available National Stock No.
4x4x4	
4x4x12	8115-00-418-4660
4x4x16	8115-00-200-6954
5x5x20	8115-01-030-3532
6x4x8	8115-00-190-4888
6x6x6	8115-00-183-9503
6x6x10	8115-00-417-9440
6x6x15	
6x6x18	8115-00-190-4920
6x6x24	8115-00-190-4921
8x4x4	8115-00-183-9500
8x8x4	8115-00-281-3878
8x8x8	8115-00-183-9498
8x8x10	8115-00-183-9499
8x8x12	8115-00-281-3882
8x8x14	
8x8x16	8115-00-190-4936
8x8x24	8115-00-417-9442
9x6x6	8115-00-190-4950
9x6x18	8115-01-029-6777
9x9x9	8115-00-418-4658
10x6x4	8115-00-183-9496
10x6x10	8115-00-255-1341
10x8x6	8115-00-183-9497
10x10x8	8115-00-183-9494
10x10x10	8115-00-190-4959
10x10x12	8115-01-034-0370
11x11x11	8115-00-417-9406
11-1/4x8-3/4x4	8115-00-515-2043
11-1/4x8-3/4x18	8115-00-190-4969
12x6x6	8115-00-183-9492
12x6x12	8115-00-190-4974

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE I. Recommended fiberboard container size list (Continued).

Container size inches (ID)	Available National Stock No.
12x6x15	8115-00-417-9380
12x9x6	8115-00-417-9379
12x9-1/2x9-1/2	8115-00-132-9531
12x12x4	8115-00-190-4860
12x12x8	8115-00-417-9378
12x12x10	8115-00-183-9490
12x12x12	8115-00-183-9491
12x12x14	8115-00-409-3807
13x13x13	
14x10x6	8115-00-495-5458
14x10x10	8115-01-030-3537
14x12x8	8115-00-183-9488
14x14x12	8115-00-183-9489
14x14x14	8115-00-417-9321
14x14x16	8115-00-585-4906
14x14x18	8115-00-417-9320
15x15x10	8115-00-417-9318
16x10x10	8115-01-030-4249
16x12x8	8115-00-183-9487
16x12x12	8115-00-418-4653
16x16x12	8115-00-451-7853
16x16x16	8115-00-190-5002
18x12x12	8115-00-514-2409
18x15x10	8115-00-190-5007
18x15x15	8115-00-417-9292
18x18x12	8115-00-183-9482
18x18x18	8115-00-428-4185
20x10x10	
20x12x12	8115-01-008-3645
20x16x16	8115-00-275-5777
20x20x6	8115-00-417-4253
20x20x12	8115-00-428-4183
20x20x20	8115-00-428-4158
22x22x12	8115-00-428-4145

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

TABLE I. Recommended fiberboard container size list (Continued).

Container size inches (ID)	Available National Stock No.
24x12x12	
24x14x14	8115-00-071-2972
24x16x12	8115-00-183-9481
24x16x16	8115-00-292-0123
24x18x18	
24x20x16	8115-00-417-9236
24x24x10	8115-00-428-4124
24x24x12	8115-00-174-2354
24x24x16	
24x24x20	
24x24x24	8115-00-417-9416
26x12x8	
26x12x10	
26x18x18	
26x26x20	
29x14x14	
30x12x6	8115-00-190-5017
30x12x12	
30x16x16	8115-00-292-0120
30x20x12	
30x20x20	
30x26x20	
32x26x16	
32x26x26	
34x14x10	8115-00-564-8053
34x20x15	
34x20x20	
36x12x12	
36x14x14	8115-00-190-5020
36x24x22	
36x26x18	
40x14x14	

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

INSTRUCTIONS: In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge *(DO NOT STAPLE)*, and mailed. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

NOTE: This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document*(s)* or to amend contractual requirements.

(Fold along this line)

(Fold along this line)

DEPARTMENT OF THE NAVY

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 12503 WASHINGTON D. C.
POSTAGE WILL BE PAID BY THE DEPARTMENT OF THE NAVY

Engineering Specifications and Standards
Department (Code 93)
Naval Air Engineering Center
Lakehurst, NJ 08733

THIS DOCUMENT PROVIDED BY THE ABBOTT AEROSPACE
TECHNICAL LIBRARY
ABBOTTAEROSPACE.COM

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE

3a. NAME OF SUBMITTING ORGANIZATION	4. TYPE OF ORGANIZATION *(Mark one)*
	☐ VENDOR
	☐ USER
b. ADDRESS *(Street, City, State, ZIP Code)*	☐ MANUFACTURER
	☐ OTHER *(Specify)*: _____

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional	b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional
c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional	8. DATE OF SUBMISSION *(YYMMDD)*

DD FORM 1426

PREVIOUS EDITION IS OBSOLETE.