

MIL-STD-647A(AT)  
12 May 1986  
SUPERSEDING  
MIL-STD-647(ORD)  
22 June 1962

MILITARY STANDARD  
PACKAGING STANDARDS, PREPARATION AND USE OF



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MIL-STD-647A(AT)

DEPARTMENT OF DEFENSE  
Washington, DC 20301

Packaging Standards, Preparation and Use of.

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## FOREWORD

The purpose of this standard is to establish the necessary criteria and requirements for broad standardization and mechanization of the packaging engineering program.

The data contained herein systemizes packaging through all phases of the engineering effort from first consideration of the item to and including final documentation. This system is designed to provide means of a completely manual effort or one which permits automatic data processing equipment to be fully employed as both an engineering and a management tool. This system, identified as data-pack, permits the complete calculations and expression of constant data by machine methods.

The fundamental objectives of this system are:

- a. To assure that items having the same, or reasonably similar, chemical and physical characteristics are packaged in a like manner.
- b. To reduce the number of packaging materials used in packaging military material.
- c. To reduce the engineering costs of producing packaging data.
- d. To reduce the man-hours required to produce, process, and file packaging data.
- e. To assure the uniformity and sustained accuracy of packaging data.

By extensive test and evaluation of materials and methods it has been determined that a limited number of the same materials and methods can be applied to a great number and variety of parts. When the selected packaging materials and methods are applied under specified controls the need for engineering and testing a package for each and every item becomes technically unnecessary and economically unjustified.

Means are provided to group multiline item inventories into a lesser workload of a limited number of groups of like items. Basic packaging instructions can then be written for a group of items as a single document, one time effort, instead of treating each line as an individual action. The amount of work and documentation required is reduced to an important extent. Criteria and instructions for converting the general data applicable to a group of items, to data peculiar to specific items is established and set forth herein.

The procedure for implementation of the data produced under this system in contracts and for supply usage will be as prescribed by the responsible technical activity.

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1. SCOPE

1.1 Purpose. The purpose of this standard is to establish the necessary criteria and control data for the development and use of basic packaging standards. The data contained herein is also intended to be used when additional standards are being prepared.

1.2 Application. This standard has application to the packaging of items of military supply having certain physical and chemical characteristics. The items to which this standard is intended to apply are of a type which permit group coverage and are defined as standard group items. The scope of this standard includes:

- a. Definitions;
- b. Standard item characteristics (categorizing);
- c. Selections of materials and methods, formulae and criteria;
- d. Preparation of packaging standards;
- e. Packaging requirements, specific and general, as applicable to the use of packaging standards; and
- f. Instructions for completion of item package control data, and a listing of packaging standards.

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## 2. REFERENCED DOCUMENTS.

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards, and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this standard to the extent specified herein.

SPECIFICATIONS  
FEDERAL

A-A-883	- Tape; Pressure-Sensitive Adhesive, Masking.
UU-C-282	- Clipboard; Plain.
VV-L-800	- Lubricating Oil, General Purpose, Preservative (Water-Dispensing, Low Temperature).
PPP-B-566	- Boxes, Folding, Paperboard.
PPP-B-636	- Boxes, Fiberboard.
PPP-C-843	- Cushioning Material, Cellulosic.
PPP-F-320	- Fiberboard; Corrugated and Solid, Sheet, Stock (Container Grade), and Cut Shapes.
PPP-P-291	- Paperboard, Wrapping and Cushioning.
PPP-T-60	- Tape: Packaging, Waterproof.
PPP-T-97	- Tape; Pressure-Sensitive, Adhesive, Filament Reinforced.

MILITARY

MIL-P-116	- Preservation, Methods of.
MIL-B-117	- Bags, Sleeves and Tubing, Interior Packaging.
MIL-B-121	- Barrier Material, Greaseproofed, Waterproofed, Flexible.
MIL-B-131	- Barrier Materials, Watervaporproof, Greaseproof, Flexible, Heat-Sealable.
MIL-P-3420	- Packaging Materials, Volatile Corrosion Inhibitor Treated, Opaque.
MIL-D-3464	- Desiccants, Activated, Bagged, Packaging Use and Static Dehumidification.
MIL-P-14232	- Parts, Equipment and Tools for Army Materiel, Packaging of.
MIL-C-16173	- Corrosion, Preventive Compound, Solvent Cutback, Cold Application.
MIL-P-17667	- Paper, Wrapping, Chemically Neutral (Non-Corrosive).
MIL-P-46002	- Preservative Oil, Contact and Volatile Corrosion Inhibited.

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

2.2 Order of precedence. In the event of a conflict between the text of this standard and the references cited herein, the text of this standard shall take precedence.

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## 3. DEFINITIONS

3.1 Categorizing. Categorizing is the process of evaluating a manufactured item for the purpose of determining and identifying certain chemical and physical characteristics. By providing criteria for defining and identifying these characteristics a means is provided for comparing items to this criteria and placing all items having the same characteristics in a single group.

3.2 Packaging standard. A packaging standard is a form which contains the basic general packaging data which is applicable to any one of an identifiable group of items.

3.3 Standard group items. Standard group items are those items which have the same physical and chemical characteristics shown on figure 1. Items falling into this classification will be of a type for which complete packaging detail can be expressed without the use of drawings, sketches, figures, or narrative which is peculiar to a single or limited number of such items.

3.4 Nonstandard group items. Nonstandard group items are items that have characteristics which prevent the use of packaging standards in prescribing the packaging requirements. Such items, because of peculiar weight, configuration, complexity, fragility, or other considerations, require packaging data which is applicable only to an individual type of item or a limited group of items. Generally, an item will be considered as nonstandard if drawings, sketches, or illustrations are required to control the dimensions or positioning of the package or of the item within the package. Items shall also be considered nonstandard if nondrawing-type instructions identified to the item are required.

3.5 Package density factor (PDF). A PDF is the weight value of one square inch of all packaging materials used in a specified packaging method or procedure. The PDF also includes allowances for seams, laps, seals, and variation in materials. The PDF is used to determine the total weight of package materials used in developing packaged item weight.

3.6 Package size increase factor (PSI). A PSI is the accumulative dimensional value of the package material. When the PSI is added to the length, width, and depth of the item; the size of the unit package is determined.

3.7 "Manual" data preparation. The term "manual," as applied to the preparation of packaging data, means that the data is developed and initially documented in complete form without the use of automatic data processing equipment.

3.8 "Machine manageable" data. The term "machine manageable" describes a system of data preparation which employs automatic data processing equipment (computers) as engineering tools. This data-pack system provides for the automatic production of packaging size, weight, cube, and quantities.

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The term, in general application, is related to any data that can be stored, sorted, analyzed, or developed by automatic data processing machines. "Manually" prepared data becomes "machine manageable" when it is converted to punched tapes or cards, or is placed on magnetic tape for machine processing.

3.9 Input data. The term "input data" refers to the basic data for each line item which must be put into a computer to obtain complete worked data in a useable form.

3.10 Programmed data. Programmed data is the data permanently stored in the computer. This data includes the formulas, equations, and constant data which, when identified to item input data, is used by the computer to produce finished data.

3.11 Output data. The term "output data" refers to the end product of an automatic data processing system. In those cases where a computer is used only as a storing and handling device, the input and output is generally the same. Under the system described, the output data is a combination of input, stored data, calculations, and determinations made by the computer.

3.12 Rigid item. A rigid item is one that is so constituted physically that force must be exerted to change its shape in any way and which will be permanently marked, deformed, or damaged by such shape changing forces.

3.13 Flexible item. A flexible item is one which, 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.

3.14 Fragility. "Fragility" refers to physical characteristics that 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 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.

3.15 Delicate item. 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 those finely balanced mechanisms, such as gyroscope equipment, potentiometers, galvanometers, devices containing filaments, and time and dimension measuring devices. Delicate items generally require some provisions within the package for impact and vibration shock isolation.

3.16 Coilable item. A coilable item is one which has the characteristics of a flexible item as described in 3.13 and the additional physical properties which permit the item to be formed into a coil for the purpose of providing more convenient package form. Items are considered as being coilable only in those cases when coiling can be accomplished without permanent deformation or damage to the item. Minimum sizes to which an item

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may be coiled will be determined by the smallest coil that can be effected without permanent deformation or damage to the item. Gaskets and O-rings, regardless of their flexibility, shall not be considered as coilable. Gaskets and O-rings are types of items which are designed to provide maximum closeness of fit or to prevent leakage of fluids or gases in pump assemblies, valve bodies, hydraulic assemblies, pressurized containers, and other similar devices. The exceptions are not intended to include items which are of semigasketing nature but are used primarily to seal against the entry of free water, dust, or wind, or seal against loss or gain of thermal qualities. Examples of these semigasketing items are door, window, and hatch seals. Coiling, for the purpose of this standard, shall include coiling, folding, and rolling. Items shall not be coiled, folded, or rolled if the cube or size of the package is greater than the noncoiled, folded, or rolled condition.

3.17 Noncoilable item. A noncoilable item is one which has the physical characteristics of a flexible item as described in 3.13 but 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.

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## 4. GENERAL REQUIREMENTS

4.1 Items requiring categorization. Repair parts and major components shall be categorized and identified to the proper category group as prescribed.

4.2 Preliminary determinations. Preliminary determinations as to how an item is used in an assembly, how it functions in its normal operating position, or its nomenclature, except in limited circumstances, has little or nothing to do with the type and degree of preservation and packaging required. The first determination shall be whether the item is standard (see 3.3) or nonstandard (see 3.4). This determination will indicate whether the item can be provided with detailed requirements by application of pre-engineering packaging data, or if packaging data engineered and identified to the specific item must be prepared.

4.3 Packaging by use of pre-engineered data. After determination that an item conforms to the criteria of standard group items (see 3.3), the chemical and physical characteristics of the item shall be established by application of the criteria shown on figure 1. Categorized items shall be packaged to the requirements of the applicable packaging standard. Nonstandard group items shall be categorized prior to preparation of detailed data.

4.4 Item characteristics. The item characteristics are primarily intended to provide means of grouping large numbers of items which may be completely dissimilar in their function but which are similar in the chemical and physical property sense. The five primary categories and the divisions are intended to identify specific characteristics which, when added together, will permit a single method of packaging to be used on all items having the same identifying category symbols. Individual categories and divisions, with a limited number of exceptions, have only a general relationship to any specific packaging method.

4.5 Chemical and physical characteristics. The following minimum essential characteristics of an item shall be considered before the packaging requirements can be determined:

- a. Surface chemistry.
- b. Surface, mechanical.
- c. Configuration-complexity.
- d. Flexibility-fragility.
- e. Size and weight.

These basic characteristics shall be utilized in the manner and order given to determine the proper group for each item categorized. Items shall be identified to each category division which most accurately describes the characteristics being considered.

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4.6 Standard item characteristics, categories, divisions, and symbols.

To provide for uniformity in placing items into common groups, the following criteria, definitions, and identifying symbols have been established. Each division of each category has been provided with an identifying symbol. The symbols have been designated in an alpha-numerical arrangement which results in an alternating letter and number as each division is determined.

Alphabetically identified categories may have 23 divisions in each category. The letters I, O, and N are not used. Numerically identified categories may have a total of 10 divisions in each category with the divisions being numbered consecutively from 1 through 9 and 0. The approved divisions for each category are as shown on figure 1, and as defined in 4.8 through 4.12. When a need for a new division is considered necessary, request for approval shall be directed to Commanding General, Headquarters, US Army Tank-Automotive Command, ATTN: AMSTA-GDS, Warren, Michigan 48397-5000.

4.7 Variations to divisions. Certain types of items have primary characteristics that result in proper categorization in a specific group, but have secondary characteristics which make it preferable that they be excluded from that group. In such instances, it is preferable that they be identified to a more appropriate category or division, rather than excluded as standard group items. Where such variations exist, they are noted in the criteria established for each primary category or division to which they apply. Data producing activities shall conform to the established categories, divisions, and exceptions.

4.8 First category-surface chemistry. Surface chemistry is the chemical nature of the surfaces of an item which are exposed to the atmospheric environment. An all-ferrous item (steel or iron) differs in its vulnerability to and rate of corrosive deterioration from an item having a surface chemistry of copper or aluminum when exposed to the same atmosphere. Similarly, when a ferrous item has been completely plated or painted, the surface chemistry, insofar as preservation and packaging is concerned, has been changed from a ferrous chemistry to that of the material used in the plating or painting. Identifying symbols are capital gothic letters.

4.8.1 Metallic, ferrous, bare-symbol A. Items in this division are comprised wholly of iron or steel, including all alloys that are predominantly ferrous. Surfaces are bare and devoid of any plating or painting. Black oxide or phosphate treatments are considered the same as a bare ferrous surface inasmuch as they are not considered as providing, without additional treatment, any appreciable protection against corrosion. High-alloy stainless steels such as austenitic, ferritic, and martensitic, although predominantly ferrous (for example, 12 percent chromium or better; such as 18 percent chromium, 8 percent nickel), shall be excluded from this division. Because of their comparable or superior resistance to atmospherically induced corrosion, they shall be categorized under "completely painted and stainless steel items" (see 4.8.5). The so-called "corrosion resistant" low-alloy steels, as opposed to the high-alloy steels excluded above, shall be categorized under this division.

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4.8.2 Metallic, ferrous, partially plated, painted, or coated-symbol B. Items in this division are comprised wholly of ferrous materials. Some portion of the exposed surfaces have been plated, painted, or coated. The vulnerability of such items to corrosion is, on the whole, the same as an all-ferrous bare item; however, a distinction is made due to the potential adverse reaction of some common platings and coatings to some of the commonly used preservative materials. Preservative material which can be used satisfactorily on a bare ferrous item cannot in all cases be used in conjunction with some surface treatments.

4.8.3 Metallic, nonferrous, bare or partially plated, painted, or coated; all completely plated or coated metallic, excluding stainless steel-symbol C. Items in this division include all those which are comprised wholly of nonferrous metals, either bare or partially plated, painted, or coated. Only those coatings comprised of metals, plastics, ceramics, or glass shall be considered as providing preservative protection. Items having coatings such as phosphates or oxidizing treatments shall be considered same as bare. This division also includes completely plated or coated ferrous and nonferrous composites.

4.8.4 Ferrous and nonferrous composites-symbol D. Items in this division are comprised of two or more materials. At least one of the materials is ferrous, and the balance is nonferrous. Included are items which have been partially plated, painted, or coated, except in those instances where the ferrous portion of the item has been completely plated or coated.

4.8.5 Completely painted and stainless steel items-symbol E. Included are all items, metallic and nonmetallic which have been completely painted. Seat cushions and similar items of nonmetallic and completely painted metallic construction shall be included in this division. Also included are stainless steel items as defined in 4.8.1.

4.8.6 Nonmetallic, composite and noncomposite-symbol F. This division includes all materials which are of nonmetallic nature, regardless of whether the item is comprised wholly of one nonmetallic material or a combination of nonmetallic materials. It also includes those types of items which are predominantly nonmetallic but which have metallic eyelets, buckles, or other type fasteners or reinforcements included in their construction. Metal items completely coated with rubber or plastic used for providing cushioning, decoration, or other nonfunctional purpose shall be included in this division.

4.8.7 Metallic, nonmetallic composites-symbol G. Items in this division are generally assemblies of one type or another. The metallic portions of the items are bare or partially painted, plated, or coated. The assemblies included in this division are comparatively simple in design or function, such as rubber items with threaded or other metallic inserts, toggle switches, cables with connectors, capacitors and resistors, fuses, condensers, hoses and ducts with metallic fittings or inserts, and oil filters.

4.8.8 Nonmetallic, special-symbol H. This division includes items normally considered as noncorrosive but which require special protection for retention of specific chemical and physical characteristics. Examples of items included in this division are rubber O-rings, cups, and gaskets.

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4.8.9 Metallic, nonmetallic, special-symbol J. Items in this division are assemblies more complex and functionally critical than those items which meet the definition of division G. Items may be electronic, electromechanical, mechanical, or hydraulic. Included are electrical devices with sensitive contacts, electronic and mechanically functioning instruments, meters, and gages.

4.9 Second category-surface mechanical. Surface mechanical references work that has been performed on the surface or surfaces of an item, and the work the surface performs in accomplishing its design function. Metallic items in this category have been provided with worked surfaces by machining, grinding, lapping, honing, polishing, coining, stamping, or other means. Nonmetallic items may be worked by mechanical means, usually by grinding and polishing. This category, through the definitions and criteria established for each division, recognizes that many items in both the metallic and nonmetallic materials are not provided with a worked surface. These items are generally cast, forged, extruded, molded, or woven with no further work on the surface. Such surfaces are generally less critical than those which have been worked. Identifying symbols are arabic numerals.

4.9.1 Bearing surfaces, open-symbol 1. A bearing surface is one which has been provided with a finely machined, ground, lapped, burnished, or polished finish. This division also includes threads which have been provided with such finishes, and with closely controlled dimensions and geometry. The threaded items are usually utilized in the control of variable movement of components of assemblies. In all cases, intimate contact with the surface of another component of an assembly is involved. This contact also involves movement of these surfaces while in contact with each other. This division also includes items which do not move in relation to the contacting part, but which have been provided with accurately controlled surfaces for the purpose of attaining intimate contact with a mating part and in which cases close fit for sealing purposes is required. The determination as to whether the item is "open" shall be made in accordance with criteria contained in 4.9.10. Rubber, plastic, and organic seals, gaskets, and such materials in combinations with metals, provided the metal portion is not the bearing surface, are excluded from this division. Also excluded are types of items such as spring shackle bolts and bushings, and carburetor and brake control cables which move in contact with tubes and guides, or any metallic item having a surface roughness greater than 63 microinches regardless of whether it is classified as a bearing. Rubber, plastic, and organic materials shall be categorized "as-manufactured, nonmetallic" (see 4.9.7), "as-manufactured, composite" (see 4.9.8), or "nonbearing" (see 4.9.3 or 4.9.4), as applicable.

4.9.2 Bearing surfaces, sealed-symbol 2. Items in this division meet all the mechanical surface characteristics of items described in 4.9.1 and are contained within a sealed area of an assembly (see 4.9.11).

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4.9.3 Nonbearing surfaces, open-symbol 3. A nonbearing surface is one which is produced by a nominal amount of machining, grinding, or other means. The surface finish provided is not critical to the functioning of the item. If relative motion in relation to another part is involved, the movement is not intimate or is insignificant, such as movement of hasps, hinges, and latches. Generally, nonbearing surfaces will not be as finely finished as bearing surfaces. To determine if an item is "open," see 4.9.10. Items having a surface finish of 250 microinches or greater are excluded from this division. Such items shall be categorized "as-manufactured".

4.9.4 Nonbearing surfaces, sealed-symbol 4. Items in this division meet all the mechanical surface characteristics of items described in 4.9.3 and are contained in a sealed area of an assembly (see 4.9.11).

4.9.5 As-manufactured, metallic, open-symbol 5. As-manufactured surfaces are those which are produced without surface finishing other than rolling, stamping, tumbling, or coining. Items may be used in the "as-cast" or "as-forged" surface condition. This division also includes items that have drilled or punched holes, or may have sawed, milled, sheared, or machined contours or cutouts. Removal of material from the surface for the purpose of noncontacting clearances or lightening of the item shall not be considered as producing a bearing surface. Any metallic item having a surface roughness of 250 microinches or greater, regardless of how or for what purpose the finish is produced, shall be included in this division. To determine if an item is "open," see 4.9.10.

4.9.6 As-manufactured, metallic, sealed-symbol 6. Items in this division meet all the mechanical surface characteristics of items described in 4.9.5 and are contained in a sealed area of an assembly. To determine an item's sealed characteristics, see 4.9.11.

4.9.7 As-manufactured, nonmetallic-symbol 7. This division includes all items of a nonmetallic surface chemistry which are not specifically categorized in 4.9.1 through 4.9.6. Surfaces of items in this division may be produced by casting, molding, extruding, weaving, or other similar means. Generally, the only significance to the surfaces provided is that, in order to produce the material or items, the material or items must have surfaces.

4.9.8 As-manufactured, composite, metallic-nonmetallic-symbol 8. Items in this division conform to the mechanical surface characteristics of those described in 4.9.5 and 4.9.7, except that they have been fabricated into a single unit or assembly that must be preserved and packaged without separation of the dissimilar chemistries.

4.9.9 Polished or ground surfaces, abrasion susceptible-symbol 9. Included in this division are all items which have been provided with a highly polished or ground surface as found in optical or reflective devices. Items in this division may be either metallic or nonmetallic.

4.9.10 Open item. When the surfaces of an item, as they exist in an assembly, are exposed to the atmospheric environment, the item shall be considered as "open" and shall be categorized in accordance with the most critical surfaces involved.

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4.9.11 Sealed item. When the entrances to the interior of an item are sealed with gaskets or closely mated surfaces under mechanical pressure, or are sealed or capable of being sealed with threaded closure devices, plastic caps excluded; the item shall be considered as being sealed. Sealed items also include assemblies which are encased or encapsulated in plastics, ceramics, glass, or metal with completely cemented, soldered, or welded joints or seams, closing all entrances into the interior of the item. Many items are considered as being sealed or submersible that only attain this characteristic when assembled to the item on which they are used. These items, as repair parts, generally have openings into the interior and, therefore, cannot be categorized as "sealed." All items conforming to the criteria of "sealed" shall be categorized in accordance with the most critical surfaces exposed to the atmosphere.

4.10 Third category-configuration, complexity. Configuration is the exterior shape of the item and is an influencing factor in determining the need for, the type, and the amount of cushioning or dunnage which will be used in packaging an item. Configuration only pertains to the exterior of an item. Complexity pertains to both exterior configuration, and to interior and exterior characteristics which render such items unique in some manner. Identifying symbols are capital gothic letters.

4.10.1 Configuration. The ability of a package to contain an item is directly related to the concentration of the weight of the item on the package material. The concentration of weight is magnified when the package is subjected to sudden acceleration or deceleration in the form of impact or sustained vibration. As a result of such magnification, the package is damaged unless adequately protected from the effects of those forces. To assist in a proper determination as to the amount and type of cushioning or support required to protect the package from the item, or to immobilize it within the package, the criteria in 4.10.2 through 4.10.13 shall apply.

4.10.2 Regular and irregular configuration. Due to the fact that an item may be subjected to impact and vibration forces in an infinite variety of attitudes during shipping and storage, no item should be considered as regular. Regularity for packaging purposes, in the ideal condition, would be an item that has absolute equality of weight distribution in relation to surface area, regardless of the face of the item in contact with an interior surface of the package when at rest. For practical packaging purposes, an arbitrary distinction must be established which defines a regular surface from one which is considered irregular. An item having regular configuration is one which has smooth surfaces without any abrupt cross section changes which produce accentuated projections and concentrated load bearing surfaces. Where determination cannot be reached by this criteria, the following formula will be utilized: when the load concentration of contact surfaces is 1 pound per square inch or less, the item shall be considered as having a regular configuration. In all cases, calculation of load concentration shall be of the face of the item having the least regular configuration. Any item which does not exceed 0.25 pound (lb) in weight shall be categorized as "regular" regardless of its configuration.

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4.10.3 Complexity. A complex item is one which, because of its composite chemical nature, assembly features, or peculiar susceptibility to corrosion, requires preservation and packaging procedures which do not conform to the comparatively simple processes of one-step procedures, such as clean, preserve, wrap, and containerize. A complex item may have a chemical nature which requires preservatives on one or more areas, but will not tolerate a preservative on another area. They may also tolerate preservatives on all areas, but not the same type preservative on each. In certain cases, preservative conforming to grade 4 of MIL-C-16173 may be used on exterior surfaces, and preservative conforming to VV-L-800 may be used on interior surfaces, or a petroleum type on the exterior and nonpetroleum type on the interior. The items may be assembled in a manner that certain areas either cannot or should not be coated with a preservative. The items may be either chemically or mechanically constituted as to prohibit the use of any contact type preservative and, therefore, require another means of protection against a corrosive environment. Complex items will generally be assemblies which may have functional components, such as the working parts of a pump or planetary gear assemblies; or they may also be comprised of various dissimilar materials with no mechanical functions, as in electrical assemblies. Simple assemblies, such as hose connections, clamps, screen assemblies, and gas tank and radiator caps, which can be cleaned, preserved, and containerized in one-step procedures, will not be considered complex.

4.10.4 Regular, noncomplex-symbol A. Items in this division conform to the criteria of "regular" as defined in 4.10.2 and are not complex as defined in 4.10.3.

4.10.5 Irregular, noncomplex-symbol B. Items in this division conform to the criteria of "irregular" as defined in 4.10.2 and are not complex as defined in 4.10.3.

4.10.6 Regular, complex, exterior preservation only-symbol C. Items in this division conform to the criteria of "regular" as defined in 4.10.2 and are complex as defined in 4.10.3. Because of the interior surface chemistry involved or peculiarities of construction, items in this division will not permit or will not tolerate the use of contact preservatives on the interior surfaces.

4.10.7 Irregular, complex, exterior preservation only-symbol D. Items in this division conform to the criteria of "irregular" as defined in 4.10.2 and are complex as defined in 4.10.3. Because of the interior surface chemistry involved or because of peculiarities of construction, items in this division will not permit or will not tolerate the use of contact preservative on the interior surfaces.

4.10.8 Regular, complex, interior preservation only-symbol E. Items in this division conform to the criteria of "regular" as defined in 4.10.2 and are complex as defined in 4.10.3. Items in this division will not permit or do not require exterior preservation.

4.10.9 Irregular, complex, interior preservation only-symbol F. Items in this division conform to the criteria of "irregular" as defined in 4.10.2 and are complex as defined in 4.10.3. Items in this division will not permit or do not require exterior preservation.

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4.10.10 Regular, complex, interior and exterior preservation-symbol G. Items in this division conform to the criteria of "regular" as defined in 4.10.2 and are complex as defined in 4.10.3. Items in this division permit and require exterior and interior preservation.

4.10.11 Irregular, complex, interior and exterior preservation-symbol H. Items in this division conform to criteria for "irregular" as defined in 4.10.2 and are complex as defined in 4.10.3. Items in this division permit and require exterior and interior preservation.

4.10.12 Regular, complex, no contact preservative permitted-symbol J. Items in this division conform to criteria for "regular" as defined in 4.10.2 and are complex as defined in 4.10.3. Because of peculiar functional or chemical characteristics, items in this division will not tolerate contact preservatives on the exterior or interior surfaces.

4.10.13 Irregular, complex, no contact preservative permitted-symbol K. Items in this division conform to criteria of "irregular" as defined in 4.10.2 and are complex as defined in 4.10.3. Because of peculiar functional or chemical characteristics, items in this division will not tolerate contact preservatives on the exterior or interior surfaces.

4.11 Fourth category-flexibility and fragility. The rigidity or degree of fragility which is an inherent part of an item is of vital importance when determinations are made as to the amount and type of physical protection which must be designed into a package. Identifying symbols are arabic numerals. The broad field of flexibility and fragility is divisible into the following subcategories (see 3.12 through 3.17).

4.11.1 Rigid, nonfragile-symbol 1. Items in this division have the physical characteristics of a rigid item as defined in 3.12, and are not fragile as defined 3.14.

4.11.2 Rigid, fragile-symbol 2. Items in this division have rigid physical characteristics as defined in 3.12, and have fragile qualities as defined in 3.14.

4.11.3 Rigid, delicate-symbol 3. Items in this division have rigid physical characteristics as defined in 3.12, and are delicate as defined in 3.15.

4.11.4 Flexible, coilable-symbol 4. Items in this division are flexible as defined in 3.13, and may be coiled as defined in 3.16, for packaging purposes.

4.11.5 Flexible, noncoilable-symbol 5. Items in this division are flexible as defined in 3.13, but are noncoilable as defined in 3.17.

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4.11.6 Flexible, compressible, deformable-symbol 6. Items in this division are flexible and compressible, and could be permanently damaged if subjected to compression or torsional loads. Items, such as rubber seals and O-rings, which demand retention of the accurate shape and size designed and manufactured into them shall be provided with package features which protect the items from deforming loads. Any item which would be rendered partially or wholly unusable by distortion due to compressing, twisting, folding, or other loads which may be encountered during packaging, shipping, or storage, shall be provided with protection against deforming loads.

4.12 Fifth category-size and weight. This category has been divided into arbitrary divisions with definite controls for weight and dimension. Except in very limited circumstances, this category will seldom influence the type or degree of preservation required for an item. This category will have direct influence on the kind of container that will be utilized and the type, grade, and class of container, as applicable. 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 identifying symbols are capital gothic letters. The prescribed divisions of this category are as specified in 4.12.1 through 4.12.9.

4.12.1 0 to 0.25 lb-symbol A. Items in this division have one dimension no greater than 1 inch (in).

4.12.2 Over 0.25 to 0.5 lb-symbol B. Items in this division have one dimension no greater than 1 in.

4.12.3 Over 0.5 to 1.0 lb-symbol C. Items in this division have one dimension no greater than 1 in.

4.12.4 Over 1.0 to 2.0 lb-symbol D. Items in this division have one dimension no greater than 1 in.

4.12.5 0 to 0.5 lb-symbol F. Items in this division have each dimension exceeding 1 in.

4.12.6 Over 0.5 to 2.0 lb-symbol G. Items in this division have each dimension exceeding 1 in.

4.12.7 Over 2.0 to 5.0 lb-symbol H. Items in this division have no dimensional restrictions.

4.12.8 Over 5.0 to 10.0 lb-symbol J. Items in this division have no dimensional restrictions.

4.12.9 Greater than 10.0 lb-symbol K. Items in this division have no dimensional restrictions.

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## 5. DETAILED REQUIREMENTS

5.1 Packaging standards. Under the established data-pack system, basic packaging requirements for each group within one of the five categories identified in section 4 shall be prepared as a single document covering all items in this group.

5.1.1 Packaging standard form. Categorization, as required and described in section 4, is intended to provide a logical means of grouping large numbers of individual items into a lesser number of groups. Packaging instructions shall be prepared for all groups of items which have been categorized in accordance with the requirements of section 4. Instructions shall be prepared and entered on a packaging standard form shown on figure 2. Only one standard shall be prepared for each group. Each standard shall be identified to its applicable group by the category division symbols pertinent to each group, such as "A1A1A."

5.1.1.1 Preparation of form. Packaging standards shall contain reference to the applicable requirements of MIL-P-14232 for the application of the materials, procedures, and methods required in the performance of packaging. Only those requirements which are peculiar to a particular category group, and are required for clarity or compliance shall be shown on the packaging standard form. General requirements of MIL-P-14232 that are implemented by a single reference to the specification shall not be shown.

5.1.2 Approved packaging standards. Only those packaging standards indexed in appendix A are approved for general use and distribution. Conversion of existing packaging data to the provisions of this standard shall be at the discretion of the individual technical activity concerned.

5.2 Pilot packaging and testing standard group items (see 3.3). Packaging data prepared for items in the standard groups will be developed without individual pilot packaging and testing of the packaged item. By use of the pre-engineered and tested formulas, the size, weight, and cube of the package may be accurately determined without pilot packaging.

5.2.1 Packaging data for nonstandard items (see 3.4). When a determination has been made that an item or a limited group of items is nonstandard, detailed packaging data, including necessary drawings, sketches, illustrations, and specific narrative type instructions, shall be prepared. To the maximum extent possible, the materials, methods, and procedures established for a group of items having similar physical and chemical characteristics shall be used in engineered packages.

5.2.1.1 Pilot packaging and testing nonstandard group items. Unless otherwise specified by the responsible technical activity, packaging and packing data prepared for nonstandard items shall be supported by pilot packaging and testing of each package design developed. Complete reports of the test results shall be prepared and submitted in accordance with the instructions of the responsible technical activity.

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5.3 Numbering of standards. For the purpose of providing maximum control and reduction of cross referencing, packaging standards shall be identified to the applicable category (see section 4). Since the items are identified to the symbol applicable to the individual standard item characteristics, the packaging requirements for the various groups shall be identified in a like manner. As an example, the packaging instructions for items having characteristics identified as A-1-A-1-A shall be identified as Standard Number A-1-A-1-A.

5.4 Limitation of materials, methods, and procedures. Activities having the responsibility for the development and preparation of packaging data shall use the established requirements and criteria in the process of determining the type and degree of preservation and packaging required for their items. By use of the requirements of this standard, a high degree of uniformity will be attained relative to the materials and methods used. Except as specified herein, variations from the materials and methods shall not be made.

5.4.1 Primary packaging materials. For the purpose of this standard, the packaging materials are classified as primary and secondary. Primary materials are those materials which, by their presence, indicate the method and submethod of MIL-P-116 that is intended. These materials are barriers, boxes, cans, and certain types of containers. To a limited degree, desiccant conforming to MIL-D-3464 can also be classified as a primary material because of its essentiality to method II of MIL-P-116.

5.4.1.1 Material requirements. The following primary materials are specified for use in the preparation of packaging standards. To the maximum extent possible, the materials shall be used in the preparation of packaging data for nonstandard group items.

5.4.1.1.1 Bag material. Material for a bag shall be polyethylene conforming to MIL-B-117, type II, class B, style 2; and barrier material conforming to MIL-B-117, type I, class E, style 1. Gauge and other details of material conforming to MIL-B-117, type II, class B, style 2 shall be as determined appropriate by the activity preparing the packaging standard for the type of item being considered.

5.4.1.1.2 Box material. Boxes shall conform to PPP-B-636 and PPP-B-566.

5.4.2 Secondary packaging materials. Secondary materials are those which generally can be varied in their usage without violating the requirements for any method or submethod as defined in MIL-P-116. Secondary materials include cushioning, intimate wraps, and preservative. For the purpose of this standard, desiccant is also classified as a secondary material. The following secondary materials are specified for use in the preparation of standards for the packaging of standard group items (see 3.3). These materials shall also be used in the preparation of engineered data for nonstandard group items (see 3.4). When circumstances require such action, variation to other special purpose secondary material shall be used in the development of data for nonstandard group items.

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5.4.2.1 Preservatives. Preservatives are limited to type I, class 2, style B of MIL-P-3420; grade 4 of MIL-C-16173; VV-L-800; and grade 2 of MIL-P-46002.

5.4.2.2 Intimate and cushion wraps. Materials employed for intimate wraps and cushioning shall be limited to type II, grade A, class 2 of MIL-B-121; type II, class 1 of MIL-P-17667; and type II, class 1 of PPP-P-291.

5.4.2.3 Tapes. Tapes shall be limited to A-A-883 and PPP-T-60.

5.4.3 Documentation of material requirements. All packaging standards (see 5.1 and figure 2) and other packaging documentation forms shall reference the material specifications and the applicable type, grade, class, style, and form.

5.4.4 Methods of preservation. The methods and submethods of preservation shall be in accordance with MIL-P-116, except submethod IC-2 (special), which shall be specified for items weighing 10 lb or greater, and for other items for which method IC is appropriate. Submethod IC-2 (special) shall utilize a second container over the bag (container-bag-container).

5.4.4.1 Methods and submethods. The number and variety of methods and submethods that have been selected provide the greatest degree of flexibility and efficiency in the use of the approved packaging materials. Additional methods or submethods, or variations shall not be used. The following methods and submethods shall be used in the preparation of packaging standards for standard group items and, to the extent possible, in the preparation of packaging data for nonstandard group items: methods I, IC-1, IC-2, IC-2 (special) container-bag-container, IC-3, IA-8, IA-15, IA-14, IIC, IIE, IIB, and III.

5.4.5 Cleaning processes and drying procedures. Except where it is known that a specific cleaning process and drying procedure is required, cleaning shall be in accordance with process C-1 of MIL-P-116, and drying shall be in accordance with any applicable procedure specified therein.

5.5 Development of packaging data by mathematical calculation. The basic premises of the system covered by this standard is that military packaging is highly repetitive and that it concerns problems primarily of a mathematical nature. By test and evaluation of materials and methods used in packaging items representing large groups of items and applying needed controls, it has been determined that adequate unit packages can be designed and used without the necessity of pilot packaging.

5.5.1 Qualitative, quantitative, and dimensional requirements. In addition to the qualitative requirements of the unit package (materials, methods, and procedures used), packaging standards shall also define the mathematical formulae for determining unit package size, weight, and cube.

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5.5.2 Calculation of unit package size. The same packaging materials applied to an item under the same controls will always result, within reasonable limits, in the same increase in length, width, and depth dimensions. Examples of the dimensional value of combinations of packaging materials used in accomplishing various submethods of MIL-P-116 are shown in figures 8 through 16 of appendix B. The dimensional values of the materials and submethods selected have been identified as PSI factors (see 3.6).

5.5.2.1 Development and use of PSI factors. The PSI factors for each authorized combination of materials and methods shall be shown on the applicable packaging standard form (see 3.2 and figure 2). Additional PSI factors may be developed by use of the dimensional values of materials shown on figures 8 through 16 of appendix B. When additional PSIs are required that are not covered by an existing packaging standard, or are required for material not shown on the figures, they shall be developed by pilot packaging under the material application controls established.

5.5.3 Material application controls. Materials used in packaging standards and specifications in accordance with the requirements of this standard shall conform to the following controls.

5.5.3.1 Calculation of intimate and cushion wraps. Calculation of the length (L) and width (W) of intimate and cushion wraps shall be based on the length (L1), width (W1), and depth (D1) of the unit item. Calculation of intimate and cushion wraps shall be in inches, as follows:

- a. The length and width for single wrap for square or rectangular items having a depth no greater than 6 in shall be calculated using the following equations:  

$$L = 2(W1) + 2(D1) + 2 \text{ in}$$

$$W = L1 + D1 + 1 \text{ in}$$
- b. The length and width for single wrap for rectangular or square items with depth greater than 6 in shall be calculated using the following equations:  

$$L = 2(W1) + 2(D1) + 2 \text{ in}$$

$$W = L1 + D1 + 2 \text{ in}$$
- c. The length and width for double wrap for rectangular or square items with depth no greater than 6 in shall be calculated using the following equations:  

$$L = 4(W1) + 4(D1)$$

$$W = L1 + D1 + 1 \text{ in}$$
- d. The length and width for double wrap for rectangular or square items with a depth greater than 6 in shall be calculated using the following equations:  

$$L = 4(W1) + 4(D1)$$

$$W = L1 + D1 + 2 \text{ in}$$

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- e. The length and width for single wrap for cylindrical items having an outside diameter no greater than 1.5 in shall be calculated using the following equations:

$$L = L1 + D1 + 1 \text{ in}$$

$$W = (3.1416)D1 + 1 \text{ in}$$

- f. The length and width for single wrap for cylindrical items having an outside diameter greater than 1.5 in shall be calculated using the following equations:

$$L = L1 + D1 + 1 \text{ in}$$

$$W = (3.1416)D1 + 2 \text{ in}$$

- g. The length and width for double wrap for cylindrical items having an outside diameter no greater than 1.5 in shall be calculated using the following equations:

$$L = L1 + D1 + 1 \text{ in}$$

$$W = [2(3.1416)]D1 + 1 \text{ in}$$

- h. The length and width for double wrap for cylindrical items having an outside diameter greater than 1.5 in shall be calculated using the following equations:

$$L = L1 + D1 + 1 \text{ in}$$

$$W = [2(3.1416)]D1 + 2 \text{ in}$$

5.5.3.2 Calculation of bag size. The length (L) and width (W) of the bag shall be based on the length (L1), width (W1), and depth (D1) of the item to be wrapped or contained. Calculations of the bag size shall be in inches, as follows:

- a. When the item depth is no greater than 1 in, the length and width of the bag shall be calculated using the following equations:

$$L = L1 + D1 + 1.5 \text{ in}$$

$$W = W1 + D1 + 0.5 \text{ in}$$

- b. When the item depth is 1 to 8 in, the length and width of the bag shall be calculated using the following equations:

$$L = L1 + D1 + 2 \text{ in}$$

$$W = W1 + D1 + 1 \text{ in}$$

- c. When the item depth is greater than 8 in, the length and width of the bag shall be calculated using the following equations:

$$L = L1 + D1 + 2.5 \text{ in}$$

$$W = W1 + D1 + 1.5 \text{ in}$$

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5.5.3.3 Standardization of bag widths. In order to reduce the number of bag sizes and to permit the use of standard width sleeve and tube stock, bag size width after calculation shall be shown in full inches only. Any calculated width exceeding an actual inch shall be extended to the next higher full inch.

5.5.3.4 Calculation of box sizes. For control and uniformity of box surface area and cost, dimensions of boxes shall be calculated using the longest dimension of the item as the depth. This procedure results in less flap area, less surface area of box, less material, and less cost. In order to develop PDFs (see 3.5), a more constant relationship of box material content to box size is maintained.

5.5.3.5 Calculation of unit package weight. The weight of the packaging material employed in any unit package can be determined without weighing each individual package design.

5.5.3.5.1 Development and use of PDFs. PDFs are developed by determining the average weight value of one square inch of any specific packaging material. By calculating the size of wraps, bags, and boxes employed in any submethod for a range of package sizes, the total weight of the individual material (see table I) and combined materials (see tables II, III, and IV of appendix B) for each package size is determined. To assure accurate evaluation, package size used in the development of PDFs shall include depths both less than and exceeding 5 in. By dividing the surface area of the package expressed in inches into the total weight of the package material, the average value of one square inch of all materials employed in each of the representative packages is determined. If a difference in PDF value greater than 10 percent exists for the greatest depth package as compared to the least depth, two PDFs shall be established for the standard. For packages having a depth no greater than 5 in, the average of all representative package PDFs no greater than 5 in shall be established. For packages greater than 5 in, the average PDF for those packages shall apply.

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TABLE I. Packaging material weights.

Specifications	Type	Grade	Class	Style	Weight <u>1/</u>
MIL-B-121	I	A	2		0.00025
MIL-B-121	II	A	2		0.0002
MIL-P-3420	I		2	B	0.00025
MIL-P-3420	II		2	B	0.0002
PPP-C-843-1/4 in	III		B		0.0004
PPP-C-843-1/2 in	III		B		0.0008
PPP-C-843-3/4 in	III		B		0.0002
PPP-C-843-1 in	III		B		0.0016
PPP-P-291	II		1		0.00035
UU-C-282			2		0.001
PPP-F-320	I	6			0.0012
AA-A-883					0.00028
PPP-T-60	III		1		0.00028
PPP-T-97	II				0.00021
MIL-B-117	I		B		0.0003
MIL-B-117	II		B		0.00025
MIL-B-117	I		C		0.00025
MIL-B-117	II		C		0.0002
MIL-B-117	I		E		0.0003
MIL-B-117	II		E		0.00025
MIL-B-131	I		E		0.0003
MIL-B-131	II		E		0.00025
PPP-B-566	D		A	II	0.0007
PPP-B-636	I		1		0.001
PPP-B-636	I	V3C	2	RSC	0.0017
PPP-B-636	I	W5C	2	RSC	0.0015
PPP-B-636	I	W5C	2	RSC	0.0017
PPP-B-636	I	V3C	2	RSC	0.002

1/ Table I shows the average weight in pounds per square inch for packaging materials. This information shall be used for developing PDFs for packaging standards.

5.5.3.5.2 Determination of unit package weight. The unit package weight (UPW) shall be determined by multiplying the surface area (SA) of the package by the PDF and adding the weight (W) of the item. The mathematical equation is:  $UPW = SA(PDF) + W$ .

5.5.4 Development of packaging data for individual items. Packaging data prepared for individual standard group items being developed manually (see 3.7) may be prepared on a packaging standard worksheet form (see figures 4 through 6). This form provides for the entry of pertinent identifying data, space and guidance for calculations, and an 80-digit table conforming to the fields and positions of the electronic accounting machine (EAM) punched cards. Upon completion of calculations and entry of item identification data, part B shall be completed in its entirety (see figures 5 and 6). Part D is used by EAM key punch operators in production of EAM cards.

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5.5.5 Packaging standards for contract and item packaging use. Except when existing approved packaging procedures and forms such as STA Form 6165, military specifications, and purchase descriptions are prescribed by a using activity; a packaging standard form as shown on figure 2 shall be used. This form shall be preprinted with the basic packaging data from the applicable packaging standard (see figure 3). When the data punched on an EAM card is entered in the package control data table of the form, the form establishes the packaging requirements for a specific item. Equipment is available which will type the package control data directly on a packaging standard form (see figure 2) from the punched EAM card.

5.5.6 Development and documentation of packaging data by automatic data processing system. The specified procedures and criteria have been designed to be completely machine manageable (see 3.8). The automatic data processing system (data-pack) permits the complete calculations and expression of constant data by machine methods. By programing the equations and all constant data required in output (see 3.11) into the computer or automatic calculator, manual effort is reduced. The package control data required on a packaging standard form (see figure 2) can be produced under the data-pack system from the following input data (see 3.9): item identification; length, width, and depth of the item; weight of the item; and unit package quantity. The input data identified by the applicable standard number is matched by the computer to the programed data (see 3.10). Programed data includes standard number (A-1-A-1-A), applicable PDF and PSI, preservation method, preservatives, data source, standard revision number, and drawing or card number. For convenience in gathering, organizing, and identifying data preparatory to conversion to computer input data, see figures 4 through 6. This form may be varied locally to be compatible with the automatic data processing system available.

5.6 Use of codes in packaging standards. All data produced and used under the requirements of this standard shall be expressed in-the-clear; that is, it shall be directly readable without required decoding. Codes shall not be used.

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6. NOTES

6.1 Intended use. This standard is intended to establish the preparation and use of packaging standards.

6.2 Subject term (key word) listing.

Packaging, Preparation and Use of, Standard for  
Preparation, Packaging, Standard for

6.3 Changes from previous issue. Asterisks or vertical lines are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

SURFACE CHEMISTRY		SURFACE MECHANICAL		CONFIGURATION & COMPLEXITY		FLEXIBILITY & FRAGILITY		SIZE & WEIGHT	
SURFACE CHEMISTRY IS THE CHEMICAL NATURE OF THE MATERIAL THAT IS EXPOSED ON THE SURFACE OF THE ITEM TO THE ATMOSPHERE I.E. IRON, ALUMINUM, PLASTIC, GLASS, ETC. THE SURFACE CHEMISTRY OF AN ITEM IS THE MOST INFLUENTIAL FACTOR IN DETERMINING WHETHER A PRESERVATIVE MAY BE USED, WHETHER ONE IS NEEDED AND THE TYPE.		SURFACE MECHANICAL IS IN REFERENCE TO THE WORK THAT HAS BEEN PERFORMED ON THE SURFACE AND THE WORK THE SURFACE PERFORMS IN ACCOMPLISHING ITS DESIGN FUNCTION. ITEMS IN THESE CATEGORIES HAVE BEEN PROVIDED WITH A WORKED SURFACE BY MACHINING, GRINDING, LAPPING, HONING, POLISHING, COINING, STAMPING, OR OTHER MEANS.		ITEMS IN THIS CATEGORY HAVE ONE OR MORE OF THE CHARACTERISTICS OF COMPLEXITY AS DESCRIBED IN REFERENCE HANDBOOK AND IN ADDITION HAVE EXTERIOR SURFACES WHICH MEET THE CRITERIA FOR REGULARITY AS DEFINED THEREIN. ITEMS MAY REQUIRE EXTERNAL OR INTERNAL PRESERVATIVE APPLICATION OR BOTH. GENERALLY, DISSIMILAR PRESERVATIVES WILL BE USED ON THE EXTERIOR AS COMPARED TO THE INTERIOR.		WHETHER AN ITEM IS RIGID OR FLEXIBLE, FRAGILE OR RUGGED IS AN IMPORTANT ELEMENT OF CONSIDERATION IN THE SELECTION OF PACKAGING METHODS AND MATERIALS. WHETHER TO USE FLEXIBLE BARRIERS AS OPPOSED TO A RIGID CONTAINER, OR TO USE A STIFFENER, AND THE DEGREE OF SHOCK ISOLATION REQUIRED IS LARGELY DETERMINED BY CONSIDERATION OF THESE CHARACTERISTICS.		THESE CHARACTERISTICS HAVE LITTLE OR NO INFLUENCE ON THE SELECTION OF METHODS OF PACKAGING INsofar AS THE DEGREE OF PRESERVATION PROTECTION IS CONCERNED. SIZE AND WEIGHT, HOWEVER, ARE IMPORTANT FACTORS IN SEPARATING LARGE QUANTITIES OF DISSIMILAR ITEMS INTO GROUPS OF COMPARABLE ITEMS CAPABLE OF BEING PACKAGED BY A SINGLE SUBMETHOD AFTER CONSIDERATION OF ALL OTHER FACTORS.	
REFERENCE PARAGRAPH 4.8		REFERENCE PARAGRAPH 4.9		REFERENCE PARAGRAPH 4.10		REFERENCE PARAGRAPH 4.11		REFERENCE PARAGRAPH 4.12	
DIVISIONS OF SURFACE CHEMISTRY		DIVISIONS OF SURFACE MECHANICAL		DIV'S OF CONFIGURATION & COMPLEXITY		DIVISIONS OF FLEXIBILITY AND FRAGILITY RIGID - HOW FRAGILE:		DIVISIONS OF SIZE AND WEIGHT	
METALLIC FERROUS BARE: IRON, STEEL	SYMBOL	STARTING - OPEN:	SYMBOL	REGULAR-NONCOMPLEX:	SYMBOL	FRAGILITY RIGID - HOW FRAGILE:	SYMBOL	0 TO 0.25 LB - ONE DIMENSION	SYMBOL
AND THEIR ALLOYS EXCEPT STAINLESS STEEL (SEE "C" BELOW)	A		1		A		1	1 IN OR UNDER & NO DIMENSION EXCEEDING 20 IN.	A
METALLIC FERROUS, PARTIALLY PLATED, PAINTED OR COATED: INCLUDES IRON STEEL AND THEIR ALLOYS EXCEPT STAINLESS STEEL (SEE "C" BELOW)	SYMBOL	STARTING - SEALED:	SYMBOL	IRREGULAR - NONCOMPLEX:	SYMBOL	RIGID - FRAGILE:	SYMBOL	OVER 0.25 TO 0.5 LB - ONE DIMENSION 1 IN OR UNDER & NO DIMENSION EXCEEDING 20 IN.	SYMBOL
	B		2		B		2		B
METALLIC, NONFERROUS, BARE OR PARTIALLY PLATED, PAINTED OR COATED - ALL COMPLETELY PLATED OR COATED METALLIC	SYMBOL	NONBEARING - OPEN:	SYMBOL	REGULAR COMPLEX - EXTERNAL PRESERVATION ONLY:	SYMBOL	RIGID - DELICATE:	SYMBOL	OVER 0.5 TO 1.0 LB - ONE DIMENSION 1 IN. OR UNDER & NO DIMENSION EXCEEDING 20 IN.	SYMBOL
	C		3		C		3		C
METALLIC COMPOSITES-COMBINATIONS OF FERROUS AND NONFERROUS METALS: BARE OR PARTIALLY PLATED, PAINTED OR COATED AND STAINLESS STEEL	SYMBOL	NONBEARING - SEALED:	SYMBOL	IRREGULAR COMPLEX - EXTERNAL PRESERVATION ONLY:	SYMBOL	FLEXIBLE - COILABLE:	SYMBOL	OVER 1.0 TO 2.0 LB - ONE DIMENSION 1 IN. OR UNDER & NO DIMENSION EXCEEDING 20 IN.	SYMBOL
	D		4		D		4		D
COMPLETELY PAINTED AND STAINLESS STEEL ITEMS INCLUDES ALL METALLIC AND NONMETALLIC PAINTED ITEMS. ALSO INCLUDES STAINLESS STEEL ITEMS (SEE 4.8.1)	SYMBOL	AS MANUFACTURED - OPEN METALLIC ONLY:	SYMBOL	REGULAR COMPLEX - INTERNAL PRESERVATION ONLY:	SYMBOL	FLEXIBLE - NONCOILABLE:	SYMBOL	0 TO 0.5 LB - ONE DIMENSION 1 IN. OR UNDER & ONE OR MORE DIMENSIONS EXCEEDING 20 IN.	SYMBOL
	E		5		E		5		E
NONMETALLIC COMPOSITE AND NONCOMPOSITE:	SYMBOL	AS MANUFACTURED - SEALED METALLIC ONLY:	SYMBOL	IRREGULAR COMPLEX - INTERNAL PRESERVATION ONLY:	SYMBOL	FLEXIBLE - COMPRESSIBLE, DEFORMABLE	SYMBOL	0 TO 0.5 LB - EACH DIMENSION EXCEEDING 1 IN.	SYMBOL
	F		6		F		6		F
METALLIC-NONMETALLIC COMPOSITE: BARE OR PARTIALLY PLATED, PAINTED OR COATED	SYMBOL	AS MANUFACTURED - NONMETALLIC:	SYMBOL	REGULAR COMPLEX - INTERNAL AND EXTERNAL PRESERVATION:	SYMBOL	NOT ASSIGNED	SYMBOL	OVER 0.5 TO 2.0 LB - EACH DIMENSION EXCEEDING 1 IN.	SYMBOL
	G		7		G		7		G
NONMETALLIC SPECIAL: ITEMS NORMALLY CONSIDERED AS NONCOMPOSITIVE WHICH REQUIRE SPECIAL PROTECTION AND FABRICATED OF RUBBER, WOOD, CANVAS, CORK, PAPER, ETC.	SYMBOL	AS MANUFACTURED COMPOSITE:	SYMBOL	IRREGULAR COMPLEX - INTERNAL AND EXTERNAL PRESERVATION:	SYMBOL	NOT ASSIGNED	SYMBOL	OVER 2.0 TO 5.0 LB - NO DIMENSIONAL RESTRICTIONS:	SYMBOL
	H		8		H		8		H
METALLIC, NONMETALLIC SPECIAL:	SYMBOL	POLISHED OR GROUND SURFACES, ABRASION SUSCEPTIBLE:	SYMBOL	REGULAR COMPLEX - NO CONTACT PRESERVATION PERMITTED:	SYMBOL	NOT ASSIGNED	SYMBOL	OVER 5.0 TO 10.0 LB - NO DIMENSIONAL RESTRICTIONS:	SYMBOL
	J		9		J		9		J
NOT ASSIGNED	SYMBOL		SYMBOL	IRREGULAR COMPLEX - NO CONTACT PRESERVATION PERMITTED:	SYMBOL	NOT ASSIGNED	SYMBOL	OVER 10.0 LB - NO DIMENSIONAL RESTRICTIONS:	SYMBOL
	K	NOT ASSIGNED	0		K		0		K

This chart is for informational purposes only; for categorizing, refer to indicated paragraph.

FIGURE 1. Standard item characteristics-categories, divisions and symbols.

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FIGURE 2. Packaging standard form, blank.

## MIL-STD-647A(AT)

PACKAGING STANDARD (MIL-STD-647)				REVISION NO. K	DATE 02/12/76	STANDARD NO. AIAIK	DATE 07-01-61
ITEM, PACKAGE CONTROL DATA							
C D P Q R S T U V W X Y Z	A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	DRAWING OR PART NUMBER		NATIONAL STOCK NUMBER		CONTROL	FSCM
PACKAGING REFERENCE		PRES METH	UNIT PKG QTY	INTER PKG QTY	UNIT PACKAGE WEIGHT	UNIT PACKAGE CUBE	UNIT PACKAGE SIZE
PACKAGE WEIGHT IS SHOWN IN 1/100THS OF A POUND AND POUNDS.			PACKAGE CUBE IS SHOWN IN 1/1000THS OF A CUBIC FOOT AND CUBIC FEET.			PACKAGE SIZE IS SHOWN IN 1/100THS OF A FOOT AND FEET.	
<p>THIS STANDARD PRESCRIBES LEVEL A PACKAGING ONLY. SPECIFICATIONS, STANDARDS AND DRAWINGS LISTED OF THE ISSUE IN EFFECT ON DATE OF INVITATION FOR BID FORM A PART OF THIS INSTRUCTION. PACKAGING, PACKING AND MARKING FOR THE ITEM IDENTIFIED HEREON SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THIS STANDARD AND THE REFERENCED AND GENERAL REQUIREMENTS OF SPECIFICATION MIL-P-14232. PACKAGE SIZE, CUBE AND WEIGHT SHOWN IN PACKAGE CONTROL DATA ARE MAXIMUM PERMISSIBLE. REQUIREMENTS FOR LEVEL B PACKAGING AND LEVELS A AND B PACKING SHALL BE AS SPECIFIED IN SPECIFICATION MIL-P-14232.</p>							
REQUIREMENT	STEP	SPECIFICATION	STYLE	TYPE	GRADE	CLASS	FORM
PRESERVATIVE	1	MIL-P-3420	B	I		2	A, B
PRESERVATIVE							
INTIMATE WRAP							
CUSHION WRAP	2	MIL-P-17667		II		1	A
STIFFENERS							
CONTAINER	3	PPP-B-636		GE		DOM	
DESICCANT							
CLOSURE	4	PPP-T-42					C
BAG MANNER	5	MIL-B-117	I	I		E	D, E
CONTAINER	6	PPP-B-636				WR	
CLOSURE	7	PPP-T-60		III		1	C
METHOD	MIL-P-116		CLEANING	MIL-P-116		DRYING	MIL-P-116
<p>A. SINGLE WRAP REQUIRED, COMPUTE SIZE IN ACCORDANCE WITH PARA. 3.4.1.1.1.1.</p> <p>B. INDIVIDUAL WRAP NOT REQUIRED FOR ITEMS WEIGHING LESS THAN .25 LBS. WHEN PACKAGED IN MULTIPLE UNIT QUANTITY.</p> <p>C. CONTAINER CLOSURE SHALL BE IN ACCORDANCE WITH PARA. 3.4.1.1.4.4.</p> <p>D. COMPUTE BAG SIZE IN ACCORDANCE WITH PARA. 3.4.1.1.4.2.</p> <p>E. CONFORM BAG AROUND ITEM - PARA. 3.4.1.1.4.3.</p> <p>F. INSPECTION PLAN D APPLIES - SECTION 4.</p> <p>EXCEPTIONS TO THIS CATEGORY AND STANDARD</p> <p>1. ANTI-FRICTION BEARINGS CLEAN AND PRESERVE ACCORDING TO SPEC. MIL-P-197.</p> <p>2. HYDRAULIC BRAKE COMPONENTS - CLEAN AND PRESERVE IN ACCORDANCE WITH PARA. 3.3.1.1.1. AND 3.3.1.3.4.</p> <p>3. OIL AND GRAPHITE IMPREGNATED ITEMS - CLEAN AND PRESERVE IN ACCORDANCE WITH PARA. 3.3.1.1.2. AND 3.3.1.3.7.</p> <p>4. INTIMATE WRAP OF BARRIER MATERIAL CONFORMING TO MIL-B-121, TYPE II, GRADE A, CLASS 2, REQUIRED WHEN APPLYING ABOVE EXCEPTIONS.</p>							

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FIGURE 3. Packaging standard form, completed.

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<b>PACKAGING STANDARD WORKSHEET</b> (MIL-STD. 647)										
<b>PART A      ITEM IDENTIFICATION - LOGISTICAL DATA</b>										
FEDERAL ITEM NAME			DRAWING OR PART NUMBER			NATIONAL STOCK NUMBER				
SINGLE ITEM WEIGHT			SINGLE ITEM SIZE			MULTIPLE UNIT QTY. SIZE				
SURFACE TRMT. (Paint, Plating, etc.)			BASIC MAT. (Steel, Plastic, etc.)			CATEGORY		CHECK		
MACH. ACCT. CODE		UNIT OF ISSUE	UNIT OF ISSUE QTY.		UNIT PKG. QTY.	SOURCE AND SIGNATURE				
<b>PART B      CALCULATIONS</b>										
			LENGTH		WIDTH		DEPTH			
1	UNIT QUANTITY ITEM SIZE		IN.		IN.		IN.			
2	PACKAGE SIZE INCREASE FACTOR (PSI)		IN.		IN.		IN.			
3	LINE 1 + LINE 2 = PACKAGE SIZE		IN.		IN.		IN.			
4	CONVERT LINE 3 TO HUNDREDTHS OF A FOOT		FT.		FT.		FT.			
<b>NOTE: OBTAIN PACKAGE SIZE INCREASE FACTOR FROM APPLICABLE STANDARD</b>										
UNIT PACKAGE CUBE. USE PACKAGE SIZE FROM LINE 3 OR 4 ABOVE.										
EXPRESS CUBE IN FEET AND THOUSANDTHS OF A CUBIC FOOT										
5	LENGTH	X WIDTH	X DEPTH	= CUBIC FEET						
CUBE OF ITEM										
EXPRESS CUBE IN FEET AND THOUSANDTHS OF A CUBIC FOOT										
6	LENGTH	X WIDTH	X DEPTH	= CUBIC FEET						
UNIT PACKAGE SURFACE AREA. USE PACKAGE SIZE FROM LINE 3 ABOVE.										
7	LENGTH	X WIDTH	= SQUARE INCH							
8	LENGTH	X DEPTH	= SQUARE INCH							
9	WIDTH	X DEPTH	= SQUARE INCH							
10	TOTAL 7 + 8 + 9		X	X	X	X	X	X	X	= SQUARE INCH
11	TOTAL FROM LINE 10		SQUARE INCH X 2				= SQUARE INCH SURFACE AREA			
WEIGHT OF UNIT PACKAGE. OBTAIN PDF FROM APPLICABLE STANDARD. EXPRESS PACKAGE WEIGHT IN POUNDS AND HUNDREDTHS OF A POUND.										
SURFACE AREA			X PDF			= PACKAGE MATERIAL WEIGHT				
MATERIAL WEIGHT			+ ITEM WEIGHT			= UNIT PACKAGE WEIGHT				
LBS										
EXTERIOR CONTAINER QUANTITY. 200 LB. MAXIMUM EXTERIOR WEIGHT LIMIT. 200 LBS. LESS 30 LBS. FOR EXTERIOR AND INTERMEDIATE CONTAINER WEIGHTS = 170 LBS. ADJUST EXTERIOR CONTAINER QUANTITY TO NEAREST QUANTITY DIVISIBLE BY FOUR.										
170 LBS. - UNIT PKG. WT.			= UNIT PACKAGES IN EXTERIOR CONTAINER							
UNIT PACKAGE WEIGHT			X QTY. IN UNIT PACKAGE			= EXTERIOR CONT. QTY.				

FIGURE 4. Packaging standard worksheet form.

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NON-STANDARD PACKAGING DATA WORKSHEET (SOP #2)																																											
TECHNICAL DATA CARD - A																																											
S T A R T	CARD NO	REV CODE	DRAWING PART NUMBER (15)															NATIONAL STOCK NUMBER (15)															LOCAL CONTROL	FSCM IDENT (5)	➔								
	1																																										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34		35	36	37	38	39	40		
➔	PACKAGING REFERENCE (8)								PRES METH (3)			UNIT PKG QTY (3)			INTER PKG QTY (3)			UNIT PKG WEIGHT (5)			UNIT PKG CUBE (4)			UNIT PACKAGE SIZE (12)								➔											
	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71		72	73	74	75	76	77	78	79	80		
ANALYTICAL CARD - B																																											
S T A R T	CARD NO	REV CODE	FEDERAL ITEM NAME (15)															NATIONAL STOCK NUMBER (15)															S L	MARKING (3)	I N S P	LEVEL OF PROT (3)	➔						
	2																																			A							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36		37	38	39	40		
➔	REV	DOCUMENT DATE								U N I T I S S U E			NO. OF SHEETS			T O C M S			S T A T I S T I C A L D A T A			C L E A N I N G			D R Y I N G			1ST PRES (2)			2ND PRES (2)			E X T E R I O R C O N T A I N E R Q U A N T I T Y (7)			C U B E O F I T E M (4)			T Y P E S T O R A G E I N D A B X			➔
	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80			
REMARKS																																											

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FIGURE 5. Nonstandard packaging data worksheet form.

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PACKAGING STANDARD WORKSHEET (SOP #2)																																																																															
PART A - LOCAL KEY PUNCH TECHNICAL DATA CARD-A																																																																															
S T R A T	CARD NONO	REV	DRAWING PART NUMBER (15)															NATIONAL STOCK NUMBER (14)															Local Control	FSCM (5)					➔																																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38		39	40																																						
➔		PACKAGING REFERENCE (8)								PRES METH (3)			UNIT PKG QTY (3)			INTER PKG QTY (3)			E N D	(23)																				➔																																							
		41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57		58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77		78	79	80																																				
PART B - COMPUTER IN-PUT DATA																																																																															
<	ID CODE		R C C O D E	STANDARD NUMBER (5)							ITEM SIZE														➔																																																						
	B										LENGTH (7)							WIDTH (7)								DEPTH (7)																																																					
	1	2		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		24	25	26	27	28																																																	
➔		ITEM WEIGHT (6)								UNIT QTY (3)			FEDERAL ITEM NAME (6)							DRAWING OR PART NUMBER (15)														➔																																													
		29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58																																																
➔		NATIONAL STOCK NUMBER (13)															Local Control (3)			FSCM (5)					(11)																																																						
		59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80																																																								
REMARKS																																																																															

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FIGURE 6. Packaging standard worksheet form.



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## APPENDIX A

40.1.2.1 Intermediate package quantity. Unless otherwise established, the intermediate package quantity shall be determined in accordance with the applicable procedures and tables of MIL-P-14232.

40.1.2.2 Unit package weight. The unit package weight of the packaged item is determined by multiplying the surface of the package by the PDF, and adding the product to the weight of the item. The weight is entered in pounds and hundredths of a pound, as appropriate.

40.1.2.3 Unit package cube. The unit package cube is determined by multiplying the length of the package by the width, and the product multiplied by the depth of the package. The cube is entered in feet and thousandths of a cubic foot, as appropriate.

40.1.2.4 Unit package size. The unit package size is determined by adding the PSI factor, shown on the packaging standard, to the dimensions of the item. The size is entered in feet and hundredths of a foot, as appropriate.

40.1.2.5 Other item package control data. Other item package control data required to properly identify the item and define the cleaning, preservation, and packaging shall be entered in the applicable position on the "item package control data" section of the packaging standard form.

40.2 Use of completed packaging standard form. The completed form (see figure 7) constitutes the necessary requirements for the items. The basic packaging data indicated on each packaging standard is either complete and self-explanatory or references a specific requirement of MIL-P-14232. When a packaging standard is specified to accomplish actual packaging operations or is used to evaluate packages, the packaging standard shall be used in conjunction with MIL-P-14232.

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## APPENDIX A

## 50. INDEX OF STANDARDS

50.1 Approved packaging standards. The following packaging standards have been approved for use and distribution in accordance with the requirements of this standard.

A1A1A	A3A1J	A5A4D	B1A1J	B3A4J	B5B1F
A1A1B	A3A1K	A5A4F	B1A1K	B3A4K	B5B1G
A1A1C	A3A4A	A5A4G	B1B1B	B3B1B	B5B1H
A1A1D	A3A4B	A5A4H	B1B1C	B3B1C	B5B1J
A1A1F	A3A4C	A5A4J	B1B1D	B3B1D	B5B1K
A1A1G	A3A4D	A5A4K	B1B1F	B3B1F	B5B4B
A1A1H	A3A4F	A5B1B	B1B1G	B3B1G	B5B4C
A1A1J	A3A4G	A5B1C	B1B1H	B3B1H	B5B4D
A1A1K	A3A4H	A5B1D	B1B1J	B3B1J	B5B4F
A1A4A	A3A4J	A5B1F	B1B1K	B3B1K	B5B4G
A1A4B	A3A4K	A5B1G	B1F1J	B3B4B	B5B4H
A1A4C	A3A5A	A5B1H	B1G1A	B3B4C	B5B4J
A1A4D	A3A5B	A5B1J	B1G1B	B3B4D	B5B4K
A1A4F	A3A5C	A5B1K	B1G1C	B3B4F	B5B5F
A1A4G	A3A5D	A5B4B	B1G1D	B3B4G	B5E1A
A1A4H	A3B1B	A5B4C	B1G1F	B3B4H	B5E1B
A1A4J	A3B1C	A5B4D	B1G1G	B3B4J	B5E1C
A1A4K	A3B1D	A5B4F	B1G1H	B3B4K	B5E1D
A1A5G	A3B1F	A5B4G	B1G1J	B3F1G	B5E1F
A1B1B	A3B1G	A5G1A	B1G1K	B3H1H	B5E1G
A1B1C	A3B1H	A5G1B	B1H1B	B3H1J	B5E1H
A1B1D	A3B1J	A5G1C	B1H1C	B3H1K	B5E1J
A1B1F	A3B1K	A5G1D	B1H1D	B5A1A	B5E1K
A1B1G	A3B4B	A5G1F	B1H1F	B5A1B	B5F1B
A1B1H	A3B4C	A5G1G	B1H1G	B5A1C	B5F1C
A1B1J	A3B4D	A5G1H	B1H1H	B5A1D	B5F1D
A1B1K	A3B4F	A5G1J	B1H1J	B5A1F	B5F1F
A1B4B	A3B4G	A5G1K	B1H1K	B5A1G	B5F1G
A1B4C	A3B4H	A5G4G	B3A1A	B5A1H	B5F1H
A1B4D	A3B4J	A5H1B	B3A1B	B5A1J	B5F1J
A1B4F	A3B4K	A5H1C	B3A1C	B5A1K	B5F1K
A1B4G	A3G1G	A5H1D	B3A1D	B5A4A	B5G1A
A1B4H	A5A1A	A5H1F	B3A1F	B5A4B	B5G1B
A1B4J	A5A1B	A5H1G	B3A1G	B5A4C	B5G1C
A1B4K	A5A1C	A5H1H	B3A1H	B5A4D	B5G1D
A1H1H	A5A1D	A5H1J	B3A1J	B5A4F	B5G1F
A1H1J	A5A1F	A5H1K	B3A1K	B5A4G	B5G1G
A3A1A	A5A1G	B1A1A	B3A4A	B5A4H	B5G1H
A3A1B	A5A1H	B1A1B	B3A4B	B5A4J	B5G1J
A3A1C	A5A1J	B1A1C	B3A4C	B5A4K	B5G1K
A3A1D	A5A1K	B1A1D	B3A4D	B5A5F	B5H1B
A3A1F	A5A4A	B1A1F	B3A4F	B5B1B	B5H1C
A3A1G	A5A4B	B1A1G	B3A4G	B5B1C	B5H1D
A3A1H	A5A4C	B1A1H	B3A4H	B5B1D	B5H1F

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## APPENDIX A

B5H1G	C3B4B	D1C1C	D3B1B	D5F1K	F7A4F
B5H1H	C3B4C	D1C1D	D3B1C	E5A1A	F7A4G
B5H1J	C3B4D	D1C1F	D3B1D	E5A1B	F7A4H
B5H1K	C3B4F	D1C1G	D3B1F	E5A1C	F7A4J
C1A1A	C3B4G	D1C1H	D3B1G	E5A1D	F7A4K
C1A1B	C3B4H	D1C1J	D3B1H	E5A1F	F7A5G
C1A1C	C3B4J	D1C1K	D3B1J	E5A1G	F7A5H
C1A1D	C3B4K	D1D1B	D3B1K	E5A1H	F7A6F
C1A1F	C5A1A	D1D1C	D3B4B	E5A1J	F7B1B
C1A1G	C5A1B	D1D1D	D3B4C	E5A1K	F7B1C
C1A1H	C5A1C	D1D1F	D3B4D	E5A4G	F7B1D
C1A1J	C5A1D	D1D1G	D3B4F	E5A4H	F7B1F
C1A1K	C5A1F	D1D1H	D3B4G	E5B1B	F7B1G
C1B1B	C5A1G	D1D1J	D3B4H	E5B1C	F7B1H
C1B1C	C5A1H	D1D1K	D3B4J	E5B1D	F7B1J
C1B1D	C5A1J	D1G1A	D3B4K	E5B1F	F7B1K
C1B1F	C5A1K	D1G1B	D3H1F	E5B1G	G1A1A
C1B1G	C5A4A	D1G1C	D5A1A	E5B1H	G1A1B
C1B1H	C5A4B	D1G1D	D5A1B	E5B1J	G1A1C
C1B1J	C5A4H	D1G1F	D5A1C	E5B1K	G1A1D
C1B1K	C5A5A	D1G1G	D5A1D	E8A1A	G1A1F
C3A1A	C5A5C	D1G1H	D5A1F	E8A1B	G1A1G
C3A1B	C5A6G	D1G1J	D5A1G	E8A1C	G1A1H
C3A1C	C5B1B	D1G1K	D5A1H	E8A1D	G1A1J
C3A1D	C5B1C	D1H1B	D5A1J	E8A1F	G1A1K
C3A1F	C5B1D	D1H1C	D5A1K	E8A1G	G1B1B
C3A1G	C5B1F	D1H1D	D5B1B	E8A1H	G1B1C
C3A1H	C5B1G	D1H1F	D5B1C	E8A1J	G1B1D
C3A1J	C5B1H	D1H1G	D5B1D	E8A1K	G1B1F
C3A1K	C5B1J	D1H1H	D5B1F	E8A4G	G1B1G
C3A4A	C5B1K	D1H1J	D5B1G	E8B1B	G1B1H
C3A4B	C5B5G	D1H1K	D5B1H	E8B1C	G1B1J
C3A4C	D1A1A	D1J1A	D5B1J	E8B1D	G1B1K
C3A4D	D1A1B	D3A1A	D5B1K	E8B1F	G1F4F
C3A4F	D1A1C	D3A1B	D5B4G	E8B1G	G1H1G
C3A4G	D1A1D	D3A1C	D5E1A	E8B1H	G1H1H
C3A4H	D1A1F	D3A1D	D5E1B	E8B1J	G1H1J
C3A4J	D1A1G	D3A1F	D5E1C	E8B1K	G1J1A
C3A4K	D1A1H	D3A1G	D5E1D	F7A1A	G1J5A
C3A5A	D1A1J	D3A1H	D5E1F	F7A1B	G1J5B
C3A5B	D1A1K	D3A1J	D5E1G	F7A1C	G1J5C
C3A5C	D1B1B	D3A1K	D5E1H	F7A1D	G1J5D
C3A5D	D1B1C	D3A4A	D5E1J	F7A1F	G1J5F
C3B1B	D1B1D	D3A4B	D5E1K	F7A1G	G1J5G
C3B1C	D1B1F	D3A4C	D5F1B	F7A1H	G1J5H
C3B1D	D1B1G	D3A4D	D5F1C	F7A1J	G1J5J
C3B1F	D1B1H	D3A4F	D5F1D	F7A1K	G1J5K
C3B1G	D1B1J	D3A4G	D5F1F	F7A4A	G1K1G
C3B1H	D1B1K	D3A4H	D5F1G	F7A4B	G1K1H
C3B1J	D1C1A	D3A4J	D5F1H	F7A4C	G1K1K
C3B1K	D1C1B	D3A4K	D5F1J	F7A4D	G1K5B

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G1K5C	G3B5C	G8A1C	G8J1B	H7A5A
G1K5D	G3B5D	G8A1D	G8J1C	H7A5B
G1K5F	G3B5F	G8A1F	G8J1D	H7A5C
G1K5G	G3B5G	G8A1G	G8J1F	H7A5D
G1K5H	G3B5H	G8A1H	G8J1G	H7A5F
G1K5J	G3B5J	G8A1J	G8J1H	H7A5G
G1K5K	G3B5K	G8A1K	G8J1J	H7A5H
G3A1A	G3C4G	G8A4A	G8J1K	H7A5J
G3A1B	G3G1H	G8A4B	G8J4A	H7A5K
G3A1C	G3G4H	G8A4C	G8J4B	H7A6A
G3A1D	G3H1H	G8A4D	G8J4C	H7A6B
G3A1F	G3H1J	G8A4F	G8J4D	H7A6C
G3A1G	G3H4H	G8A4G	G8J4F	H7A6D
G3A1H	G3J1A	G8A4H	G8J4G	H7A6F
G3A1J	G3J1B	G8A4J	G8J4H	H7A6G
G3A1K	G3J1C	G8A4K	G8J4J	H7A6H
G3A4A	G3J1D	G8A5A	G8J4K	H7A6J
G3A4B	G3J1F	G8A5B	G8K1B	H7A6K
G3A4C	G3J1G	G8A5C	G8K1C	J8J1A
G3A4D	G3J1H	G8A5D	G8K1D	J8J1B
G3A4F	G3J1J	G8A5F	G8K1F	J8J1C
G3A4G	G3J1K	G8A5G	G8K1G	J8J1D
G3A4H	G3J4A	G8A5H	G8K1H	J8J1F
G3A4J	G3J4B	G8A5J	G8K1J	J8J1G
G3A4K	G3J4C	G8A5K	G8K1K	J8J1H
G3A5A	G3J4D	G8A6F	G8K4B	J8J1J
G3A5B	G3J4F	G8B1B	G8K4C	J8J1K
G3A5C	G3J4G	G8B1C	G8K4D	J8K1B
G3A5D	G3J4H	G8B1D	G8K4F	J8K1C
G3A5F	G3J4J	G8B1F	G8K4G	J8K1D
G3A5G	G3J4K	G8B1G	G8K4H	J8K1F
G3A5H	G3K1B	G8B1H	G8K4J	J8K1G
G3A5J	G3K1C	G8B1J	G8K4K	J8K1J
G3A5K	G3K1D	G8B1K	H7A1A	J8K1K
G3B1B	G3K1F	G8B4B	H7A1B	
G3B1C	G3K1G	G8B4C	H7A1C	
G3B1D	G3K1H	G8B4D	H7A1D	
G3B1F	G3K1J	G8B4F	H7A1F	
G3B1G	G3K1K	G8B4G	H7A1G	
G3B1H	G3K4B	G8B4H	H7A1H	
G3B1J	G3K4C	G8B4J	H7A1J	
G3B1K	G3K4D	G8B4K	H7A1K	
G3B4B	G3K4F	G8B5B	H7A4A	
G3B4C	G3K4G	G8B5C	H7A4B	
G3B4D	G3K4H	G8B5D	H7A4C	
G3B4F	G3K4J	G8B5F	H7A4D	
G3B4G	G3K4K	G8B5G	H7A4F	
G3B4H	G3K5G	G8B5H	H7A4G	
G3B4J	G3K6F	G8B5J	H7A4H	
G3B4K	G8A1A	B8B5K	H7A4J	
G3B5B	G8A1B	B8J1A	H7A4K	

## MIL-STD-647A(AT)

## APPENDIX A

PACKAGING STANDARD (MIL-STD-647A)										REVISION NO. K		DATE 02/12/76		STANDARD NO. A3B1H		DATE 07-01-61	
ITEM, PACKAGE CONTROL DATA																	
DRAWING OR PART NUMBER		NATIONAL STOCK NUMBER										CONTROL		FSCM			
1 7 0 0 5 1 3 9		5 3 1 0 0 0 2 7 6 8 7 1 0										- 5 0 6		1 9 2 0 7			
PACKAGING REFERENCE		PRES METH		UNIT PKG QTY		INTER PKG QTY		UNIT PACKAGE WEIGHT		UNIT PACKAGE CUBE		UNIT PACKAGE SIZE					
S A 3 E 1 H - H		1 C 2		0 0 1		0 0 8		0 0 3 7 3		0 0 4 6		0 0 6 8 X 0 0 6 4 X 0 0 1 0					
PACKAGE WEIGHT IS SHOWN IN 1 100THS OF A POUND AND POUNDS.				PACKAGE CUBE IS SHOWN IN 1 1000THS OF A CUBIC FOOT AND CUBIC FEET.				PACKAGE SIZE IS SHOWN IN 1 100THS OF A FOOT AND FEET.									
THIS STANDARD PRESCRIBES LEVEL A PACKAGING ONLY. SPECIFICATIONS, STANDARDS AND DRAWINGS LISTED OF THE ISSUE IN EFFECT ON DATE OF INVITATION FOR BID FORM A PART OF THIS INSTRUCTION. PACKAGING, PACKING AND MARKING FOR THE ITEM IDENTIFIED HEREON SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THIS STANDARD AND THE REFERENCED AND GENERAL REQUIREMENTS OF SPECIFICATION MIL-P-14232. PACKAGE SIZE, CUBE AND WEIGHT SHOWN IN PACKAGE CONTROL DATA ARE MAXIMUM PERMISSIBLE. REQUIREMENTS FOR LEVEL B PACKAGING AND LEVELS A AND B PACKING SHALL BE AS SPECIFIED IN SPECIFICATION MIL-P-14232.																	
REQUIREMENT	STEP	SPECIFICATION	STYLE	TYPE	GRADE	CLASS	FORM	NOTES									
PRESERVATIVE	1	MIL-P-3420	B	I		2		A, B									
PRESERVATIVE																	
INTIMATE WRAP																	
CUSHION WRAP	2	PPP-P-291	I	III				A									
STIFFENERS																	
CONTAINER	3	PPP-R-566	II	D		A											
DESICCANT																	
CLOSURE	4	PPP-T-42						C									
BAG BARRIER	5	MIL-B-117	2	I	(4 MIL)	B		D, E									
CONTAINER																	
CLOSURE																	
METHOD		MIL-P-116		CLEANING		MIL-P-116		DRYING		MIL-P-116							
PRON EN951460 GROUP																	
<p>A. SINGLE WRAP REQUIRED, COMPUTE SIZE IN ACCORDANCE WITH PARA. 3.4.1.1.1.1.</p> <p>B. INDIVIDUAL WRAP NOT REQUIRED FOR ITEMS WEIGHING LESS THAN .25 LBS. WHEN PACKAGED IN MULTIPLE UNIT CAPACITY.</p> <p>C. CONTAINER CLOSURE SHALL BE IN ACCORDANCE WITH PARA. 3.4.1.1.4.4.</p> <p>D. COMPUTE BAG SIZE IN ACCORDANCE WITH PARA. 3.4.1.1.4.2.</p> <p>E. CONFORM BAG AROUND ITEM - PARA. 3.4.1.1.4.3.</p> <p>F. INTERMEDIATE CONTAINER REQUIRED - PARA. 3.4.1.2.</p> <p>G. INDIVIDUAL UNIT PACKAGES EXCEEDING .375 CU. FT. SHALL BE OVER-WRAPPED WITH BARRIER MATERIAL CONFORMING TO SPEC. MIL-B-13239.</p> <p>H. INSPECTION PLAN H APPLIES - SECTION 4.</p>																	
EXCEPTIONS TO THIS CATEGORY AND STANDARD																	
<p>1. HYDRAULIC BRAKE COMPONENTS - CLEAN AND PRESERVE IN ACCORDANCE WITH PARA. 3.3.1.1.1. AND PARA. 3.3.1.3.4.</p> <p>2. OIL AND GRAPHITE IMPREGNATED ITEMS - CLEAN AND PRESERVE IN ACCORDANCE WITH PARA. 3.3.1.1.2. AND PARA. 3.3.1.3.7.</p> <p>3. INTIMATE WRAP OF BARRIER MATERIAL CONFORMING TO MIL-B-121, TYPE 11, GRADE A, CLASS 2, REQUIRED WHEN APPLYING ABOVE EXCEPTIONS.</p>																	

STA FORM  
1 AUG 75 513

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

FIGURE 7. Packaging standard form, completed.

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## APPENDIX B

## TABLES, CHARTS, AND SUPPLEMENTAL DATA

## 10. GENERAL

10.1 Scope. This appendix covers certain general type data for instructional purposes and does not form a mandatory part of the standard. The information contained herein is also for use as guidance in the development of additional packaging standards.

10.2 Use of data. Figures, charts, and other type data contained herein are intended for use by those responsible for the preparation of packaging standards and other types of packaging data.

10.3 Description of data. Figures 8 through 16 of this appendix indicate the effect that packaging materials have on the size, weight, and cube of packages. Reference figures and similar data shall be used as guides when additional PSI factors are developed. Tables II, III, and IV show PDFs for various size packages using the same material. Examples shown are for illustrative purposes only and are not to be used in lieu of any PDF shown on an approved packaging standard.

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## APPENDIX B

TABLE II. PDFs.

Package size	Single		Single-single		Double		Single-double		Single 291	
	566 IC2	Bag IA15	566 IC2	Bag IA15	566 IC2	Bag IA15	566 IC2	Bag IA15	566 IC2	Bag IA15
4 x 3 x 2	.00118	.00133	.00139	.00154	.00134	.0015	.00143	.00157	.00143	.00157
7 x 4 x 3	.00123	.00138	.00144	.00159	.0014	.00155	.00159	.00173	.00159	.00173
8 x 6 x 5	.0013	.00144	.00153	.00167	.0015	.00165	.00168	.00182	.00168	.00182
8 x 7 x 6	.00133	.00147	.00152	.00171	.00159	.00173	.00176	.0019	.00176	.0019
9 x 9 x 8	.00142	.00157	.00169	.00184	.00165	.0018	.00189	.00203	.00189	.00203
10 x 6 x 5	.00127	.00141	.0015	.00164	.00146	.0016	.00165	.00178	.00165	.00178
10 x 10 x 8	.00142	.00156	.00168	.00183	.0016	.00174	.00189	.00202	.00189	.00202
12 x 7 x 9	.00145	.0016	.00173	.00188	.00169	.00184	.00194	.00208	.00194	.00208
15 x 12 x 10	.00134	.00148	.0016	.00173	.00157	.00171	.00181	.00194	.00181	.00194
5" and under	.00124	.00139	.00146	.00161	.00142	.00157	.00159	.00172	.00159	.00172
Over 5"	.00139	.00153	.00164	.0018	.00162	.00176	.00186	.00199	.00186	.00199
PDF averages	.00133	.00147	.00156	.00171	.00153	.00168	.00174	.00187	.00174	.00187
Size increases	.75 x .4375	x .4375	.8125 x .4375	x .4375	.8125 x .4375	x .4375	1. x .5	x .5	1. x .5	x .5

## NOTES:

- For method II packages in accommodating the desiccant add 0.0008 (per square inch) to each PDF factor established above.
- MIL-B-43014--stiff--0.0013--1.125 x 1.125 x 0.250 IC2 and IA-15 bags with all wraps either 121, 130, 3420 and with 291 listed separately.

TABLE III. PDFs.

Package size	Single		Single-single		Single-Double		Double		Single 291	
	636 IC2	Bag IA15	636 IC2	Bag IA15	636 IC2	Bag IA15	636 IC2	Bag IA15	636 IC2	Bag IA15
4 X 3 X 2	.00140	.00159	.00151	.00166	.00193	.00210	.....	.....	.00144	.00158
7 X 4 X 3	.00152	.00167	.00167	.00182	.00198	.00213	.....	.....	.00180	.00197
8 X 6 X 5	.00189	.00212	.0018	.00195	.00210	.00225	.....	.....	.00193	.00208
8 X 7 X 6	.00171	.00186	.00186	.00201	.00210	.00224	.....	.....	.002	.00215
9 X 9 X 8	.00176	.00191	.00199	.00214	.00225	.00239	.....	.....	.00217	.00232
10 X 6 X 5	.00159	.00173	.00177	.00191	.00210	.00216	.....	.....	.00197	.00212
10 X 10 X 8	.00171	.00185	.00192	.00206	.00217	.00232	.00190	.00203	.00210	.00225
12 X 7 X 9	.00182	.00197	.00206	.00221	.00230	.00245	.00201	.00216	.00223	.00239
15 X 12 X 10	.00169	.00182	.00191	.00205	.00197	.00211	.....	.....	.00208	.00222
15 X 12 X 9	.01509	.01652	.01463	.01781	.01881	.02015	.....	.....	.01772	.01908
Size increases	1.125 x .5	x .5	1.1875 x .5625	x .5625	1.375 x .625	x .625	1.1875 x .5625	x .5625	1.5625 x .875	x .875
PDF averages	.0016	.0018	.0017	.0018	.0020	.0022	.0017	.0018	.0018	.0019
5" and under	.0017	.0019	.0019	.0021	.0022	.0023	.0019	.0021	.0021	.0023
PDF averages over 5"										

NOTE: For IA-14 II and IC-2 add 0.0015 for extra carton and 0.5 x 0.25 x 0.25.

TABLE IV. PDFs.

Package size	Bag only		Single		Single-single		Double		Single-double		Single 291	
	IC1	IA8	IC1	IA8	IC1	IA8	IC1	IA8	IC1	IA8	IC1	IA8
1 x 1 x 1	.00054	.00067	.00063	.00075	.0007	.0008	.00071	.00081	.00076	.00085	.00076	.00085
3 x 1 x 1	.00042	.00053	.00062	.00072	.00064	.00072	.00063	.00072	.00071	.00079	.00071	.00079
2 x 2 x 1	.0004	.0005	.00053	.00062	.00064	.00072	.00064	.00072	.00073	.00081	.00073	.00081
4 x 4 x 1	.00031	.00039	.00046	.00053	.0006	.00067	.0006	.00073	.00073	.00079	.00073	.00079
5 x 2 x 1	.00034	.00042	.00048	.00056	.00061	.00068	.0006	.00067	.00071	.00078	.00071	.00078
8 x 8 x 1	.00026	.00033	.00044	.0005	.0006	.00066	.0006	.00066	.00075	.00081	.00075	.00081
10 x 10 x 1	.00025	.00031	.00043	.00049	.0006	.00066	.00059	.00065	.00075	.00081	.00075	.00081
10 x 3 x 1	.00029	.00036	.00044	.00051	.00059	.00065	.00058	.00065	.00071	.00078	.00071	.00078
15 x 2 x 1	.0003	.00037	.00044	.00051	.00059	.00065	.00057	.00063	.00069	.00076	.00069	.00076
15 x 10 x 1	.00024	.0003	.00042	.00048	.00059	.00065	.00059	.00065	.00076	.00081	.00076	.00081
20 x 2 x 1	.0003	.00038	.00045	.00053	.00059	.00066	.00058	.00065	.00071	.00077	.00071	.00077
PDF average	.00033	.00041	.00048	.00056	.00061	.00068	.0006	.00068	.00072	.00079	.00072	.00079
Size increase	.5 x .375 x .125		.625 x .5 x .25		.75 x .625 x .3125		.6875 x .5625 x .3125		.8125 x .6875 x .375		1.375 x .750 x .625	

## NOTES:

1. This table lists PDFs for methods IC-1 and IA-8, utilizing various combinations of flexible wraps, such as MIL-B-121, MIL-B-130, MIL-I-3420, and PPP-C-291.
2. The PDF average figures listed are for type II bags.
3. When type I bags are specified on the standards, the PDF shall be increased by 0.005.

CUSHIONING AND UNIT CONTAINER	LOCK, SPRING, RETAINER 20/32 X 16/32 X 10/32 .098 CU. IN .136 OUNCE CONTROL NO. 3009-60	BREAKER ASSEMBLY 2-5/32 X 22/32 X 19/32 .080 CU. IN .55 OUNCE CONTROL NO. 3009-20	INSERT, VALVE 2 IN O.D. X 11/32 1.375 CU. IN 1.675 OUNCES CONTROL NO. 3009-50	GUIDE, VALVE 22/32 O.D. X 2-31/32 1.403 CU. IN 2.625 OUNCES CONTROL NO. 3009-52	PINION, GEAR 2-10/32 O.D. X 28/32 4.679 CU. IN 7.833 OUNCES CONTROL NO. 3009-94	RETAINER 6-28/32 X 3-4/32 X 17/32 11.412 CU. IN 9.275 OUNCES CONTROL NO. 3009-77
MIL-B-121, TYPE II, GRADE A, CLASS 2 MIL-B-117, TYPE II, CLASS E BAG (CREPED)	1-20/32 X 1-17/32 X 18/32 1.400 CU. IN .272 OUNCE	3 X 1-16/32 X 24/32 3.375 CU. IN .76 OUNCE	2-29/32 X 2-28/32 X 17/32 4.438 CU. IN 1.845 OUNCES	4-4/32 X 1-17/32 X 28/32 5.527 CU. IN 2.761 OUNCE	3-2/32 X 3-11/32 X 1-2/32 10.880 CU. IN 8.208 OUNCES	7-26/32 X 4-5/32 X 23/32 23.340 CU. IN 10.121 OUNCES
INCREASE SIZE-CUBE-WEIGHT	1 X 1-32 X 8/32 1.302 CU. IN .136 OUNCE	27/32 X 26/32 X 5/32 2.495 CU. IN .21 OUNCE	29/32 X 18/32 X 6/32 3.063 CU. IN .170 OUNCE	1-5/32 X 27/32 X 6/32 4.124 CU. IN .136 OUNCE	24/32 X 1-17/32 X 6/32 6.201 CU. IN .375 OUNCE	30/32 X 1-1/32 X 6/32 11.928 CU. IN .846 OUNCE
MIL-B-121, TYPE II, GRADE A, CLASS 2 MIL-B-130, TYPE II (CREPED) MIL-B-117, TYPE II, CLASS E BAG (CREPED)			2-29/32 X 2-29/32 X 18/32 4.751 CU. IN 1.925 OUNCES	4-4/32 X 1-20/32 X 30/32 6.284 CU. IN 2.831 OUNCES	3-8/32 X 3-13/32 X 1-3/32 12.109 CU. IN 8.378 OUNCES	8-4/32 X 4-18/32 X 23/32 26.646 CU. IN 10.521 OUNCES
INCREASE SIZE-CUBE-WEIGHT			29/32 X 9/32 X 7/32 3.376 CU. IN .250 OUNCE	1-5/32 X 30/32 X 8/32 4.861 CU. IN .206 OUNCE	30/32 X 1-3/32 X 7/32 7.430 CU. IN .545 OUNCE	1-8/32 X 1-14/32 X 6/32 15.234 CU. IN 1.246 OUNCES
MIL-B-121, TYPE II, GRADE A, CLASS 2, PPP-P-291, TYPE II MIL-B-117, TYPE II, CLASS E BAG (CREPED)					3-11/32 X 3-23/32 X 1-8/32 15.544 CU. IN 8.541 OUNCES	8-8/32 X 4-20/32 X 28/32 33.387 CU. IN 10.621 OUNCES
INCREASE SIZE-CUBE-WEIGHT					1-1/32 X 1-13/32 X 12/32 10.865 CU. IN .708 OUNCE	1-12/32 X 1-16/32 X 11/32 21.975 CU. IN 1.346 OUNCES
INCREASE SIZE-CUBE-WEIGHT						
INCREASE SIZE-CUBE-WEIGHT						
INCREASE SIZE-CUBE-WEIGHT						

NOTES: 1. All sizes given in 32nds of an inch. 2. All weights given in ounces. 3. All cubes given in cubic inches. 4. All bag sizes calculated:  
 $\text{length} \times \text{width} \times 1 \frac{1}{2} = \text{length}$   
 $\text{width} \times \text{depth} \times 1 = \text{width}$  5. All intimate cushioning wraps calculated:  
 $\text{length} \times (3 \times \text{depth}) \times \text{width}$   
 $(3 \times \text{width}) \times (2 \times \text{depth}) \times \text{length}$

FIGURE 8. Comparative unit package sizes-methods IC-1 and IA-8.

	THROWSTAY	CLAR	SHAYT	HUB	SEAL	ROD
<b>CUSHIONING, UNIT CONTAINER AND BARRIER</b>	2-4/32 O.D. X 1-28/32 8.467 CU. IN 3.000 OUNCES  CONTROL NO. 3009-90	2-18/32 O.D. X 1-14/32 9.439 CU. IN 1 LB. 2.00 OUNCES  CONTROL NO. 3009-30	1-28/32 O.D. X 5-18/32 19.556 CU. IN 1 LB. 13.333 OUNCES  CONTROL NO. 3009-25	4-29/32 O.D. X 1-30/32 38.937 CU. IN 4 LB. 11.500 OUNCES  CONTROL NO. 3009-27	6-18/32 O.D. X 1-5/32 49.793 CU. IN 1 LB. 3.000 OUNCES  CONTROL NO. 3009-95	9-16/32 X 3-23/32 X 1-14/32 50.795 CU. IN 2 LB. 3.250 OUNCES  CONTROL NO. 3009-37
MIL-B-121, TYPE II, GRADE A, CLASS 2 PPP-B-566, STYLE II, TYPE A, CLASS A, .032 MIL-B-117, TYPE I, CLASS B	2-12/32 X 2-9/32 X 2-8/32 BOX 2-1/8 X 2-1/8 X 2 BAG 5-1/2 X 6 12.190 CU. IN 3.909 OUNCES	2-28/32 X 2-28/32 X 1-20/32 BOX 2-5/8 X 1-1/2 X 2 5/8 BAG 5 X 5-1/2 13.432 CU. IN 1 LB. 2.861 OUNCES	6-3/32 X 2-6/32 X 1-30/32 BOX 1-7/8 X 1-7/8 X 5-7/8 BAG 5 X 9-1/2 25.827 CU. IN 1 LB. 14.749 OUNCES		7 X 6-27/32 X 1-13/32 BOX 6-3/4 X 1-1/4 X 6-3/4 BAG 9 X 9-1/2 67.366 CU. IN 1 LB. 6.177 OUNCES	9-24/32 X 3-26/32 X 1-19/32 BOX 9-5/8 X 3-3/4 X 1-1/2 BAG 6 X 12-1/2 59.245 CU. IN 2 LB. 6.049 OUNCES
<b>INCREASE SIZE-CUBE-WEIGHT</b>	8/32 X 5/32 X 12/32 3.723 CU. IN .969 OUNCE	10/32 X 10/32 X 6/32 3.994 CU. IN .881 OUNCE	17/32 X 10/32 X 2/32 6.271 CU. IN 1.416 OUNCES		14/32 X 9/32 X 8/32 17.573 CU. IN 3.177 OUNCES	8/32 X 3/32 X 5/32 8.450 CU. IN 2.799 OUNCES
MIL-B-121, TYPE II, GRADE A, CLASS 2 PPP-B-566, STYLE II, TYPE A, CLASS A, .032 MIL-B-117, TYPE I, CLASS B	2-21/32 X 2-14/32 X 2-13/32 BOX 2-1/4 X 2-1/4 X 2-1/8 BAG 5-1/2 X 6 15.580 CU. IN 4.352 OUNCES	3 X 2-30/32 X 1-24/32 BOX 2-3/4 X 1-5/8 X 2-3/4 BAG 5 X 5-1/2 15.422 CU. IN 1 LB. 3.269 OUNCES	6-7/32 X 2-10/32 X 2-2/32 BOX 2 X 2 X 6 BAG 5 X 9-1/2 29.661 CU. IN 1 LB. 15.289 OUNCES		7-4/32 X 6-31/32 X 1-17/32 BOX 6-7/8 X 1-3/8 X 6-7/8 BAG 9 X 9-1/2 76.028 CU. IN 1 LB. 7.154 OUNCES	9-28/32 X 3-30/32 X 1-23/32 BOX 9-3/4 X 3-7/8 X 1-5/8 BAG 6-1/2 X 13 66.832 CU. IN 2 LB. 6.919 OUNCES
<b>INCREASE SIZE-CUBE-WEIGHT</b>		14/32 X 12/32 X 10/32 5.963 CU. IN 1.269 OUNCES	21/32 X 14/32 X 6/32 10.105 CU. IN 1.956 OUNCES		18/32 X 13/32 X 12/32 26.235 CU. IN 4.154 OUNCES	12/32 X 7/32 X 9/32 16.037 CU. IN 3.669 OUNCES
MIL-B-121, TYPE II, GRADE A, CLASS 2 PPP-B-636, TYPE I, CLASS 1, OPP MIL-B-117, TYPE I, CLASS B			6-16/32 X 2-16/32 X 2-12/32 BOX 2 X 2 X 6 BAG 6 X 10-1/2 38.594 CU. IN 1 LB. 14.986 OUNCES	5-17/32 X 5-10/32 X 2-15/32 BOX 5 X 5 X 2 BAG 9 X 9-1/2 72.544 CU. IN 4 LB. 14.746 OUNCES	7-8/32 X 7-4/32 X 1-22/32 BOX 6-3/4 X 6-3/4 X 1-1/4 BAG 9-1/2 X 10 87.170 CU. IN 1 LB. 6.754 OUNCES	9-28/32 X 4-6/32 X 1-28/32 BOX 9-5/8 X 3-3/4 X 1-1/2 BAG 7 X 13-1/2 77.533 CU. IN 2 LB. 6.600 OUNCES
<b>INCREASE SIZE-CUBE-WEIGHT</b>			30/32 X 20/32 X 16/32 19.083 CU. IN 1.853 OUNCES	20/32 X 13/32 X 17/32 33.607 CU. IN 3.246 OUNCES	22/32 X 18/32 X 17/32 37.377 CU. IN 3.754 OUNCES	12/32 X 15/32 X 14/32 26.738 CU. IN 3.410 OUNCES
MIL-B-121, TYPE II, GRADE A, CLASS 2 MIL-B-130, TYPE II PPP-B-636, TYPE I, CLASS 1, OPP MIL-B-117, TYPE I, CLASS B			6-16/32 X 2-16/32 X 2-12/32 BOX 2 X 2 X 5 BAG 6 X 10-1/2 38.594 CU. IN 1 LB. 15.426 OUNCES	5-17/32 X 5-10/32 X 2-15/32 BOX 5 X 5 X 2 BAG 9 X 9-1/2 72.544 CU. IN 4 LB. 15.590 OUNCES		9-26/32 X 4-6/32 X 1-26/32 BOX 9-5/8 X 3-3/4 X 1-1/2 BAG 7 X 13-1/2 77.533 CU. IN 2 LB. 7.530 OUNCES
<b>INCREASE SIZE-CUBE-WEIGHT</b>			30/32 X 20/32 X 16/32 19.038 CU. IN 2.093 OUNCES	20/32 X 13/32 X 17/32 33.607 CU. IN 4.090 OUNCES		12/32 X 15/32 X 14/32 26.738 CU. IN 4.280 OUNCES
MIL-B-121, TYPE II, GRADE A, CLASS 2 PPP-B-291, TYPE II PPP-B-636, TYPE I, CLASS 1, OPP MIL-B-117, TYPE I, CLASS B			7-3/32 X 1-22/32 X 2-16/32 BOX 6-3/4 X 2-1/4 X 2-1/4 BAG 6 X 11 47.661 CU. IN 2 LB. .165 OUNCE	6-8/32 X 5-30/32 X 2-19/32 BOX 5-3/4 X 5-1/4 X 2-1/4 BAG 9-1/2 X 10 96.254 CU. IN 5 LB. .294 OUNCE		10-20/32 X 4-15/32 X 2-12/32 BOX 10-1/4 X 4 X 2 BAG 7-1/2 X 14-1/2 112.767 CU. IN 2 LB. 8.689 OUNCES
<b>INCREASE SIZE-CUBE-WEIGHT</b>			1-17/32 X 26/32 X 20/32 28.105 CU. IN 2.832 OUNCES	1-11/32 X 1-1/32 X 11/32 57.317 CU. IN 4.794 OUNCES		1-4/32 X 24/32 X 30/32 81.972 CU. IN 5.439 OUNCES

NOTES: 1. All sizes given in inches.  
2. All weights given in pounds and ounces.  
3. All cubes given in cubic inches.

4. All bag sizes calculated:  
length + width + 1 1/2 + length  
width + depth + 1 + width

5. All intimate and cushioning wraps  
calculated:  
length + (3 x depth) = width  
(3 x width) + (2 x depth) + length

FIGURE 9. Comparative unit package sizes-methods IC-2 and IA-15.

	ITEM SIZE	ITEM SIZE	ITEM SIZE	ITEM SIZE	ITEM SIZE	ITEM SIZE
	6 x 6 x 2 72 cu. in.	7 x 5 x 2 70 cu. in.	8 x 6 x 2 96 cu. in.	8 x 6 x 4 192 cu. in.	10 x 8 x 6 480 cu. in.	4 x 4 x 12 <sup>17</sup> / <sub>16</sub> 192 cu. in.
MATERIALS	PACKAGE SIZE	PACKAGE SIZE	PACKAGE SIZE	PACKAGE SIZE	PACKAGE SIZE	PACKAGE SIZE
MIL-B-121, TYPE II, GR. A, CL. 2 PPP-B-566 MIL-B-117, TYPE I, CLASS E PPP-B-636, RSC	7 1/8 x 7 1/8 x 3 1/8 158.655 cu. in.	8 1/8 x 6 1/8 x 3 1/8 155.530 cu. in.	9 1/8 x 7 1/8 x 3 1/8 203.174 cu. in.			
INCREASE	Size Weight Cube	Size Weight Cube	Size Weight Cube			
	1 1/8 x 1 1/8 x 1 1/8 7.8715 ounces 86.655 cu. in.	1 1/8 x 1 1/8 x 1 1/8 8.6639 ounces 85.53 cu. in.	1 1/8 x 1 1/8 x 1 1/8 10.0162 ounces 107.174 cu. in.			
MIL-B-130, TYPE II PPP-B-566 MIL-B-117, TYPE I, CLASS E PPP-B-636, RSC	7 1/8 x 7 1/8 x 3 1/8 158.655 cu. in.	8 1/8 x 6 1/8 x 3 1/8 155.53 cu. in.	9 1/8 x 7 1/8 x 3 1/8 203.174 cu. in.			
INCREASE	Size Weight Cube	Size Weight Cube	Size Weight Cube			
	1 1/8 x 1 1/8 x 1 1/8 8.1795 ounces 86.655 cu. in.	1 1/8 x 1 1/8 x 1 1/8 8.9865 ounces 85.53 cu. in.	1 1/8 x 1 1/8 x 1 1/8 10.3858 ounces 107.174 cu. in.			
MIL-B-130, TYPE II, (2 Wraps) PPP-B-566 MIL-B-117, TYPE I, CLASS E PPP-B-636, RSC	7 3/8 x 7 1/8 x 3 1/8 164.209 cu. in.	8 3/8 x 6 1/8 x 3 1/8 160.303 cu. in.	9 3/8 x 7 1/8 x 3 1/8 208.74 cu. in.			
INCREASE	Size Weight Cube	Size Weight Cube	Size Weight Cube			
	1 3/8 x 1 1/8 x 1 1/8 9.1363 ounces 92.209 cu. in.	1 3/8 x 1 1/8 x 1 1/8 9.8845 ounces 90.303 cu. in.	1 3/8 x 1 1/8 x 1 1/8 11.558 ounces 112.74 cu. in.			
MIL-B-121, TYPE II, GR. A, CL. 2 MIL-B-130, TYPE II PPP-B-566 MIL-B-117, TYPE I, CLASS E PPP-B-636, RSC	7 1/8 x 7 1/8 x 3 1/8 158.655 cu. in.	8 1/8 x 6 1/8 x 3 1/8 155.53 cu. in.	9 1/8 x 7 1/8 x 3 1/8 203.174 cu. in.			
INCREASE	Size Weight Cube	Size Weight Cube	Size Weight Cube			
	1 1/8 x 1 1/8 x 1 1/8 8.8483 ounces 86.655 cu. in.	1 1/8 x 1 1/8 x 1 1/8 9.5919 ounces 85.83 cu. in.	1 1/8 x 1 1/8 x 1 1/8 11.1882 ounces 107.174 cu. in.			
MIL-B-121, TYPE II, GR. A, CL. 2 PPP-B-636, OPP MIL-B-117, TYPE I, CLASS E PPP-B-636, RSC	7 3/8 x 7 1/4 x 3 3/8 180.457 cu. in.	8 3/8 x 6 1/4 x 3 3/8 176.658 cu. in.	9 3/8 x 7 1/4 x 3 3/8 229.395 cu. in.			
INCREASE	Size Weight Cube	Size Weight Cube	Size Weight Cube			
	1 3/8 x 1 1/8 x 1 3/8 8.8496 ounces 108.457 cu. in.	1 3/8 x 1 1/4 x 1 3/8 8.2996 ounces 106.688 cu. in.	1 3/8 x 1 1/4 x 1 3/8 10.8289 ounces 133.395 cu. in.			
MIL-B-130, TYPE II PPP-B-636, OPP MIL-B-117, TYPE I, CLASS E PPP-B-636, RSC	7 3/8 x 7 1/4 x 3 3/8 180.457 cu. in.	8 3/8 x 6 1/4 x 3 3/8 176.658 cu. in.	9 3/8 x 7 1/4 x 3 3/8 229.395 cu. in.			
INCREASE	Size Weight Cube	Size Weight Cube	Size Weight Cube			
	1 3/8 x 1 1/4 x 1 3/8 9.1576 ounces 100.457 cu. in.	1 3/8 x 1 1/4 x 1 3/8 8.3982 ounces 106.658 cu. in.	1 3/8 x 1 1/4 x 1 3/8 10.8985 ounces 133.395 cu. in.			
MIL-B-130, TYPE II, (2 Wraps) PPP-B-636, OPP MIL-B-117, TYPE I, CLASS E PPP-B-636, RSC	7 7/8 x 7 1/2 x 3 5/8 214.102 cu. in.	8 7/8 x 6 1/2 x 3 5/8 209.117 cu. in.	9 7/8 x 7 1/2 x 3 5/8 268.477 cu. in.			
INCREASE	Size Weight Cube	Size Weight Cube	Size Weight Cube			
	1 7/8 x 1 1/2 x 1 5/8 10.9743 ounces 142.102 cu. in.	1 7/8 x 1 1/2 x 1 3/8 10.142 ounces 139.117 cu. in.	1 7/8 x 1 1/2 x 1 5/8 12.700 ounces 172.477 cu. in.			

NOTE: 4 x 4 x 12 item utilized, 4-1/4 x 4-1/4 x 12-1/2 inner carton, and 4-7/8 x 4-5/8 x 13-1/4 outer carton.

FIGURE 10. Item to unit package size (method 1A-14).

	4 x 6 BAGS		6 x 8 BAGS		8 x 10 BAGS	
	ITEM SIZE	ITEM SIZE	ITEM SIZE	ITEM SIZE	ITEM SIZE	ITEM SIZE
	2 3/4 x 1 1/4 x 1 1/4 4.297 cu. in	3 1/4 x 1 3/4 x 3/4 4.266 cu. in	3 5/4 x 2 1/4 x 2 1/4 18.984 cu. in	4 1/4 x 2 3/4 x 1 3/4 20.453 cu. in	4 3/4 x 3 1/4 x 3 1/4 50.172 cu. in	5 1/4 x 3 3/4 x 2 3/4 54.141 cu. in
MATERIALS	PACKAGE SIZE	PACKAGE SIZE	PACKAGE SIZE	PACKAGE SIZE	PACKAGE SIZE	PACKAGE SIZE
MIL-B-121, TYPE II, GR. A. CL. 2 PPP-B-566 MIL-B-117, TYPE I, CLASS B	3 5/16 x 1 14/16 x 1 11/16 10.481 cu. in	3 13/16 x 2 6/16 x 1 3/16 10.752 cu. in	4 5/16 x 2 14/16 x 2 11/16 33.321 cu. in	4 13/16 x 3 6/16 x 2 3/16 35.530 cu. in	5 5/16 x 3 14/16 x 3 11/16 75.911 cu. in	5 13/16 x 4 6/16 x 3 3/16 81.057 cu. in
INCREASE	Size	9/16 x 10/16 x 7/16	9/16 x 10/16 x 7/16	9/16 x 10/16 x 7/16	9/16 x 10/16 x 7/16	9/16 x 10/16 x 7/16
	Weight	.7156 ounce	.7247 ounce	1.5904 ounces	1.7883 ounces	2.816 ounces
	Cube	6.184 cu. in	6.486 cu. in	14.337 cu. in	15.077 cu. in	26.916 cu. in
MIL-B-130, TYPE II PPP-B-566 MIL-B-117, TYPE I, CLASS B	3 6/16 x 1 15/16 x 1 12/16 11.443 cu. in	3 14/16 x 2 7/16 x 1 4/16 11.807 cu. in	4 6/16 x 2 15/16 x 2 12/16 35.342 cu. in	4 14/16 x 3 7/16 x 2 4/16 37.705 cu. in	5 6/16 x 3 15/16 x 3 12/16 79.365 cu. in	5 14/16 x 4 7/16 x 3 4/16 84.729 cu. in
INCREASE	Size	10/16 x 11/16 x 8/16	10/16 x 11/16 x 8/16	10/16 x 11/16 x 8/16	10/16 x 11/16 x 8/16	10/16 x 11/16 x 8/16
	Weight	.7681 ounce	.7814 ounce	1.7164 ounces	1.9201 ounces	2.9914 ounces
	Cube	7.146 cu. in	7.541 cu. in	16.358 cu. in	17.252 cu. in	30.588 cu. in
MIL-B-130, TYPE II (2 Wraps) PPP-B-566 MIL-B-117, TYPE I, CLASS B	3 8/16 x 2 1/16 x 14/16 13.535 cu. in	4 2 9/16 x 1 6/16 14.094 cu. in	4 8/16 x 3 1/16 x 2 14/16 39.621 cu. in	5 2 9/16 x 2 6/16 42.303 cu. in	5 8/16 x 4 1/16 x 3 14/16 86.582 cu. in	6 2 9/16 x 3 6/16 92.391 cu. in
INCREASE	Size	12/16 x 13/16 x 10/16	12/16 x 13/16 x 10/16	12/16 x 13/16 x 10/16	12/16 x 13/16 x 10/16	12/16 x 13/16 x 10/16
	Weight	.9346 ounce	.9612 ounce	2.1160 ounces	2.3375 ounces	3.7943 ounces
	Cube	9.238 cu. in	9.828 cu. in	20.637 cu. in	21.852 cu. in	38.250 cu. in
MIL-B-121, TYPE II, GR. A. CL. 2 MIL-B-130, TYPE II PPP-B-566 MIL-B-117, TYPE I, CLASS B	3 7/16 x 2 x 1 13/16 12.461 cu. in	3 15/16 x 2 8/16 x 1 5/16 12.920 cu. in	4 7/16 x 3 2 x 1 13/16 37.441 cu. in	4 15/16 x 3 8/16 x 2 5/16 39.963 cu. in	5 7/16 x 4 x 3 13/16 82.922 cu. in	5 15/16 x 4 8/16 x 3 5/16 88.506 cu. in
INCREASE	Size	11/16 x 12/16 x 9/16	11/16 x 12/16 x 9/16	11/16 x 12/16 x 9/16	11/16 x 12/16 x 9/16	11/16 x 12/16 x 9/16
	Weight	.8821 ounce	.9045 ounce	1.990 ounces	2.2059 ounces	3.4854 ounces
	Cube	8.164 cu. in	8.654 cu. in	18.457 cu. in	19.510 cu. in	32.750 cu. in
MIL-B-121, TYPE II, GR. A. CL. 2 PPP-B-636, OPP MIL-B-117, TYPE I, CLASS B	3 7/16 x 2 1/16 x 2 14.180 cu. in	3 15/16 x 2 9/16 x 1 8/16 15.135 cu. in	4 7/16 x 3 1/16 x 3 40.801 cu. in	4 15/16 x 3 9/16 x 2 8/16 44.001 cu. in		
INCREASE	Size	11/16 x 13/16 x 12/16	11/16 x 13/16 x 12/16	11/16 x 13/16 x 12/16	11/16 x 13/16 x 12/16	
	Weight	.8539 ounce	.9503 ounce	1.6998 ounces	1.8385 ounces	
	Cube	9.883 cu. in	10.469 cu. in	21.817 cu. in	23.548 cu. in	
MIL-B-130, TYPE II PPP-B-636, OPP MIL-B-117, TYPE I, CLASS B	3 8/16 x 2 2/16 x 2 1/16 15.340 cu. in	4 2 10/16 x 1 9/16 16.406 cu. in	4 8/16 x 3 2/16 x 3 1/16 43.067 cu. in	5 3 10/16 x 2 9/16 46.446 cu. in		
INCREASE	Size	12/16 x 14/16 x 13/16	12/16 x 14/16 x 13/16	12/16 x 14/16 x 13/16	12/16 x 14/16 x 13/16	
	Weight	.9064 ounce	1.0070 ounces	1.8258 ounces	1.9701 ounces	
	Cube	11.043 cu. in	12.140 cu. in	24.083 cu. in	25.993 cu. in	

NOTES: 1. All fractions for unit package sizes and increases given are in inches.  
2. All cube displacement given in cubic inches.

FIGURE 11. Item to unit package size-(method IA-15).

	4 X 6 BAGS		6 X 8 BAGS		8 X 10 BAGS	
	ITEM SIZE	ITEM SIZE	ITEM SIZE	ITEM SIZE	ITEM SIZE	ITEM SIZE
	2 3/4 x 1 1/4 x 1 1/4 4.297 cu. in.	3 1/4 x 1 3/4 x 3/4 4.264 cu. in.	3 3/4 x 2 1/4 x 2 1/4 18.984 cu. in.	4 1/4 x 2 3/4 x 1 3/4 20.433 cu. in.	4 3/4 x 3 1/4 x 3 1/4 50.172 cu. in.	5 1/4 x 3 3/4 x 2 3/4 54.141 cu. in.
MATERIALS	PACKAGE SIZE	PACKAGE SIZE	PACKAGE SIZE	PACKAGE SIZE	PACKAGE SIZE	PACKAGE SIZE
MIL-B-121, TYPE II, CR. A. CL. 2 PPP-B-566 MIL-B-117, TYPE I, CLASS B	3 5/16 x 1 14/16 x 1 11/16 10.481 cu. in.	3 13/16 x 2 6/16 x 1 3/16 10.752 cu. in.	4 5/16 x 2 14/16 x 2 11/16 33.321 cu. in.	4 13/16 x 3 6/16 x 2 5/16 35.530 cu. in.	5 5/16 x 3 14/16 x 3 11/16 75.911 cu. in.	5 13/16 x 4 6/16 x 3 3/16 81.057 cu. in.
INCREASE	Size Weight Cube	9/16 x 10/16 x 7/16 .7156 ounce 8.184 cu. in.	9/16 x 10/16 x 7/16 .7247 ounce 8.486 cu. in.	9/16 x 10/16 x 7/16 1.5904 ounces 14.337 cu. in.	9/16 x 10/16 x 7/16 1.7883 ounces 15.077 cu. in.	9/16 x 10/16 x 7/16 2.7639 ounces 23.739 cu. in.
	11/16 x 1 15/16 x 1 12/16 11.445 cu. in.	1 14/16 x 2 7/16 x 1 4/16 11.807 cu. in.	4 6/16 x 2 15/16 x 2 12/16 35.342 cu. in.	4 14/16 x 3 7/16 x 2 4/16 37.705 cu. in.	5 6/16 x 3 15/16 x 3 12/16 79.365 cu. in.	5 14/16 x 4 7/16 x 3 4/16 84.729 cu. in.
INCREASE	Size Weight Cube	10/16 x 11/16 x 8/16 .7681 ounce 7.146 cu. in.	10/16 x 11/16 x 8/16 .7814 ounce 7.541 cu. in.	10/16 x 11/16 x 8/16 1.7161 ounces 16.358 cu. in.	10/16 x 11/16 x 8/16 1.9201 ounces 17.252 cu. in.	10/16 x 11/16 x 8/16 2.9915 ounces 29.193 cu. in.
	12/16 x 1 1/16 x 1 13/16 13.535 cu. in.	1 1/16 x 2 1/16 x 1 1/16 14.094 cu. in.	4 8/16 x 3 1/16 x 2 14/16 39.621 cu. in.	5 3/16 x 3 7/16 x 2 6/16 42.305 cu. in.	5 8/16 x 4 1/16 x 3 14/16 86.582 cu. in.	6 1/16 x 4 9/16 x 3 8/16 92.391 cu. in.
INCREASE	Size Weight Cube	12/16 x 13/16 x 10/16 .9346 ounce 9.238 cu. in.	12/16 x 13/16 x 10/16 .9612 ounce 9.828 cu. in.	12/16 x 13/16 x 10/16 2.1112 ounces 20.637 cu. in.	12/16 x 13/16 x 10/16 2.3375 ounces 21.852 cu. in.	12/16 x 13/16 x 10/16 3.7129 ounces 34.410 cu. in.
	13/16 x 1 1/16 x 1 13/16 12.461 cu. in.	1 15/16 x 2 1/16 x 1 3/16 12.920 cu. in.	4 7/16 x 3 1/16 x 2 13/16 37.441 cu. in.	4 15/16 x 3 8/16 x 2 5/16 39.963 cu. in.	5 7/16 x 4 1/16 x 3 13/16 82.922 cu. in.	5 13/16 x 4 8/16 x 3 5/16 88.506 cu. in.
INCREASE	Size Weight Cube	11/16 x 12/16 x 9/16 .8821 ounce 8.164 cu. in.	11/16 x 12/16 x 9/16 .9045 ounce 8.659 cu. in.	11/16 x 12/16 x 9/16 1.990 ounces 18.557 cu. in.	11/16 x 12/16 x 9/16 2.2059 ounces 19.110 cu. in.	11/16 x 12/16 x 9/16 3.4834 ounces 32.750 cu. in.
	13/16 x 1 1/16 x 1 1/16 14.180 cu. in.	1 13/16 x 2 9/16 x 1 8/16 15.135 cu. in.	4 7/16 x 3 1/16 x 3 40.801 cu. in.	4 15/16 x 3 8/16 x 2 8/16 44.001 cu. in.		
INCREASE	Size Weight Cube	11/16 x 13/16 x 12/16 .8539 ounce 9.883 cu. in.	11/16 x 13/16 x 12/16 .9503 ounce 10.869 cu. in.	11/16 x 13/16 x 12/16 1.6998 ounces 21.817 cu. in.	11/16 x 13/16 x 12/16 1.8385 ounces 23.548 cu. in.	
	13/16 x 1 1/16 x 1 1/16 15.340 cu. in.	1 1/16 x 2 1/16 x 1 8/16 16.406 cu. in.	4 8/16 x 3 2/16 x 3 1/16 43.067 cu. in.	5 3/16 x 3 10/16 x 2 8/16 46.446 cu. in.		
INCREASE	Size Weight Cube	12/16 x 15/16 x 13/16 .9064 ounce 11.043 cu. in.	12/16 x 14/16 x 13/16 1.0970 ounce 12.157 cu. in.	12/16 x 14/16 x 13/16 1.8258 ounces 24.083 cu. in.	12/16 x 14/16 x 13/16 1.9701 ounces 25.493 cu. in.	

## NOTES:

1. All fractions for unit package sizes and increases given are in inches.
2. All cube displacement given in cubic inches.

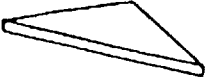


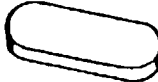
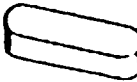
FIGURE 12. Item to unit package size-(method 1C-2).

	4 X 6 BAGS		5 X 8 BAGS		8 X 10 BAGS	
	ITEM SIZE	ITEM SIZE	ITEM SIZE	ITEM SIZE	ITEM SIZE	ITEM SIZE
	$2 \frac{3}{4} \times 1 \frac{1}{4} \times 1 \frac{1}{4}$ 4.297 cu. in.	$3 \frac{1}{4} \times 1 \frac{3}{4} \times 3 \frac{1}{4}$ 4.266 cu. in.	$3 \frac{3}{4} \times 2 \frac{1}{4} \times 2 \frac{1}{4}$ 18.984 cu. in.	$4 \frac{1}{4} \times 2 \frac{3}{4} \times 1 \frac{3}{4}$ 20.433 cu. in.	$4 \frac{3}{4} \times 3 \frac{1}{4} \times 3 \frac{1}{4}$ 30.172 cu. in.	$5 \frac{1}{4} \times 3 \frac{3}{4} \times 2 \frac{3}{4}$ 36.141 cu. in.
MATERIALS	PACKAGE SIZE	PACKAGE SIZE	PACKAGE SIZE	PACKAGE SIZE	PACKAGE SIZE	PACKAGE SIZE
MIL-B-130, TYPE II (2 Wraps) PPP-B-636, OPP MIL-B-117, TYPE I, CLASS B	$3 \frac{10}{16} \times 2 \frac{4}{16} \times 2 \frac{3}{16}$ 17.842 cu. in.	$4 \frac{2}{16} \times 1 \frac{12}{16} \times 1 \frac{11}{16}$ 19.142 cu. in.	$4 \frac{10}{16} \times 3 \frac{4}{16} \times 3 \frac{3}{16}$ 47.913 cu. in.	$5 \frac{2}{16} \times 3 \frac{12}{16} \times 2 \frac{11}{16}$ 51.651 cu. in.		
INCREASE	Size	$14/16 \times 1 \times 15/16$	$14/16 \times 1 \times 15/16$	$14/16 \times 1 \times 15/16$	$14/16 \times 1 \times 15/16$	
	Weight Cube	1.0729 ounces 13.345 cu. in.	1.1088 ounces 14.878 cu. in.	2.2234 ounces 28.929 cu. in.	2.3875 ounces 31.198 cu. in.	
MIL-B-121, TYPE II, GR. A, CL. 2 MIL-B-130, TYPE II PPP-B-636, OPP MIL-B-117, TYPE I, CLASS B	$3 \frac{9}{16} \times 2 \frac{3}{16} \times 2 \frac{2}{16}$ 16.360 cu. in.	$4 \frac{1}{16} \times 1 \frac{11}{16} \times 1 \frac{10}{16}$ 17.743 cu. in.	$4 \frac{9}{16} \times 3 \frac{5}{16} \times 3 \frac{3}{16}$ 43.448 cu. in.	$5 \frac{1}{16} \times 3 \frac{11}{16} \times 2 \frac{10}{16}$ 49.004 cu. in.		
INCREASE	Size	$13/16 \times 15/16 \times 14/16$	$13/16 \times 15/16 \times 14/16$	$13/16 \times 15/16 \times 14/16$	$13/16 \times 15/16 \times 14/16$	
	Weight Cube	1.0204 ounces 12.263 cu. in.	1.1304 ounces 13.477 cu. in.	2.0994 ounces 26.464 cu. in.	2.2559 ounces 28.551 cu. in.	
MIL-B-121, TYPE II, GR. A, CL. 2 PPP-B-636, RSC MIL-B-117, TYPE I, CLASS B			$4 \frac{11}{16} \times 3 \frac{1}{16} \times 2 \frac{15}{16}$ 42.170 cu. in.	$5 \frac{3}{16} \times 3 \frac{9}{16} \times 2 \frac{7}{16}$ 43.047 cu. in.	$5 \frac{11}{16} \times 4 \frac{1}{16} \times 3 \frac{15}{16}$ 90.978 cu. in.	$6 \frac{3}{16} \times 4 \frac{9}{16} \times 3 \frac{7}{16}$ 97.042 cu. in.
INCREASE	Size		$15/16 \times 13/16 \times 11/16$	$15/16 \times 13/16 \times 11/16$	$15/16 \times 13/16 \times 11/16$	$15/16 \times 13/16 \times 11/16$
	Weight Cube		1.7721 ounces 23.184 cu. in.	1.9423 ounces 24.594 cu. in.	3.1859 ounces 40.805 cu. in.	3.2721 ounces 42.901 cu. in.
MIL-B-130, TYPE II PPP-B-636, RSC MIL-B-117, TYPE I, CLASS B			$4 \frac{12}{16} \times 3 \frac{2}{16} \times 3$ 44.532 cu. in.	$5 \frac{7}{16} \times 3 \frac{10}{16} \times 2 \frac{8}{16}$ 47.539 cu. in.	$5 \frac{12}{16} \times 4 \frac{2}{16} \times 4$ 94.875 cu. in.	$6 \frac{4}{16} \times 4 \frac{10}{16} \times 3 \frac{8}{16}$ 101.172 cu. in.
INCREASE	Size		$1 \times 14/16 \times 12/16$	$1 \times 14/16 \times 12/16$	$1 \times 14/16 \times 12/16$	$1 \times 14/16 \times 12/16$
	Weight Cube		1.8981 ounces 23.348 cu. in.	2.0431 ounces 27.124 cu. in.	3.4134 ounces 44.703 cu. in.	3.3066 ounces 47.031 cu. in.
MIL-B-130, TYPE II (2 Wraps) PPP-B-636, RSC MIL-B-117, TYPE I, CLASS B			$4 \frac{14}{16} \times 3 \frac{4}{16} \times 3 \frac{2}{16}$ 49.513 cu. in.	$5 \frac{4}{16} \times 3 \frac{12}{16} \times 2 \frac{10}{16}$ 52.911 cu. in.	$5 \frac{14}{16} \times 4 \frac{4}{16} \times 4 \frac{2}{16}$ 102.996 cu. in.	$6 \frac{6}{16} \times 4 \frac{12}{16} \times 3 \frac{10}{16}$ 109.770 cu. in.
INCREASE	Size		$1 \frac{2}{16} \times 1 \times 14/16$	$1 \frac{2}{16} \times 1 \times 14/16$	$2/16 \times 1 \times 14/16$	$1 \frac{2}{16} \times 1 \times 14/16$
	Weight Cube		2.2977 ounces 30.529 cu. in.	2.4923 ounces 32.448 cu. in.	4.1349 ounces 52.824 cu. in.	4.2503 ounces 55.629 cu. in.
MIL-B-121, TYPE II, GR. A, CL. 2 MIL-B-130, TYPE II PPP-B-636, RSC MIL-B-117, TYPE I, CLASS B			$4 \frac{13}{16} \times 3 \frac{3}{16} \times 3 \frac{1}{16}$ 47.010 cu. in.	$5 \frac{3}{16} \times 3 \frac{11}{16} \times 2 \frac{9}{16}$ 50.226 cu. in.	$5 \frac{13}{16} \times 4 \frac{3}{16} \times 4 \frac{1}{16}$ 98.881 cu. in.	$6 \frac{5}{16} \times 4 \frac{11}{16} \times 3 \frac{9}{16}$ 105.414 cu. in.
INCREASE	Size		$1 \frac{1}{16} \times 15/16 \times 13/16$	$1 \frac{1}{16} \times 15/16 \times 13/16$	$1 \frac{1}{16} \times 15/16 \times 13/16$	$1 \frac{1}{16} \times 15/16 \times 13/16$
	Weight Cube		2.1717 ounces 28.025 cu. in.	2.1599 ounces 29.773 cu. in.	3.9074 ounces 48.709 cu. in.	4.0158 ounces 51.273 cu. in.

## NOTES:

1. All fractions for unit package sizes and increases given are in inches.
2. All cube displacement given in cubic inches.



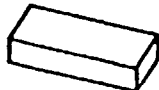

FIGURE 13. Item to unit package size-(method IC-2).

					
MATERIALS	2 X 1 X 8/32	1-3/4 X 3/4 X 16/32	1-5/8 X 5/8 X 20/32	2 X 1 X 8/32	1-3/4 X 3/4 X 16/32
MIL-B-117, TYPE II, CLASS B (NO WRAP)	2 31/32 X 1 22/32 X 10/32 1.566 CU.	2 29/32 X 1 20/32 X 18/32 2.656 CU.	2 27/32 X 1 18/32 X 22/32 3.055	2 31/32 X 1 22/32 X 10/32 1.566 CU.	2 29/32 X 1 20/32 X 18/32 2.656 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
	31/32 X 22/32 X 2/32 .06669 1.066	1 5/32 X 28/32 X 2/32 .06669 2.000	1 7/32 X 30/32 X 2/32 .06669 2.420	31/32 X 22/32 X 2/32 .06669 1.066	1 5/32 X 28/32 X 2/32 .06669 2.000
MIL-B-117, TYPE II, CLASS B MIL-B-121, TYPE II, GR. A, CLASS 2	2 30/32 X 1 21/32 X 13/32 1.976 CU.	2 28/32 X 1 19/32 X 21/32 3.006 CU.	2 26/32 X 1 17/32 X 25/32 3.363 CU.	2 30/32 X 1 21/32 X 13/32 1.976 CU.	2 28/32 X 1 19/32 X 21/32 3.006 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
	30/32 X 21/32 X 5/32 .11189 1.476	1 4/32 X 27/32 X 5/32 .10868 2.350	1 6/32 X 29/32 X 5/32 .10706 2.728	30/32 X 21/32 X 5/32 .11189 1.476	1 4/32 X 27/32 X 5/32 .10868 2.350
MIL-B-117, TYPE II, CLASS B MIL-B-130, TYPE II	2 29/32 X 1 20/32 X 14/32 2.066 CU.	2 27/32 X 1 18/32 X 22/32 3.055 CU.	2 25/32 X 1 16/32 X 26/32 3.389 CU.	2 29/32 X 1 20/32 X 14/32 2.066 CU.	2 27/32 X 1 18/32 X 22/32 3.055 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
	29/32 X 20/32 X 6/32 .13273 1.566	1 3/32 X 26/32 X 6/32 .12802 2.399	1 5/32 X 28/32 X 6/32 .12565 2.754	29/32 X 20/32 X 6/32 .13273 1.566	1 3/32 X 26/32 X 6/32 .12802 2.399
MIL-B-117, TYPE II, CLASS C (NO WRAP)	2 31/32 X 1 22/32 X 10/32 1.566 CU.	2 29/32 X 1 20/32 X 18/32 2.656 CU.	2 27/32 X 1 18/32 X 22/32 3.055 CU.	2 31/32 X 1 22/32 X 10/32 1.566 CU.	2 29/32 X 1 20/32 X 18/32 2.656 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
	31/32 X 22/32 X 2/32 .06669 1.066	1 5/32 X 28/32 X 2/32 .06669 2.000	1 7/32 X 30/32 X 2/32 .06669 2.420	31/32 X 22/32 X 2/32 .06669 1.066	1 5/32 X 28/32 X 2/32 .06669 2.000
MIL-B-117, TYPE II, CLASS C MIL-B-121, TYPE II, GR. A, CLASS 2	2 30/32 X 1 21/32 X 13/32 1.976 CU.	2 28/32 X 1 19/32 X 21/32 3.006 CU.	2 26/32 X 1 17/32 X 25/32 3.363 CU.	2 30/32 X 1 21/32 X 13/32 1.976 CU.	2 28/32 X 1 19/32 X 21/32 3.006 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
	30/32 X 21/32 X 5/32 .11189 1.476	1 4/32 X 27/32 X 5/32 .10868 2.350	1 6/32 X 29/32 X 5/32 .10706 2.728	30/32 X 21/32 X 5/32 .11189 1.476	1 4/32 X 27/32 X 5/32 .10868 2.350
MIL-B-117, TYPE II, CLASS C MIL-B-130, TYPE II	2 29/32 X 1 20/32 X 14/32 2.066 CU.	2 27/32 X 1 18/32 X 22/32 3.055 CU.	2 25/32 X 1 16/32 X 26/32 3.389 CU.	2 29/32 X 1 20/32 X 14/32 2.066 CU.	2 27/32 X 1 18/32 X 22/32 3.055 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
	29/32 X 20/32 X 6/32 .13273 1.566	1 3/32 X 26/32 X 6/32 .12802 2.399	1 5/32 X 28/32 X 6/32 .12565 2.754	29/32 X 20/32 X 6/32 .13273 1.566	1 3/32 X 26/32 X 6/32 .12802 2.399
MIL-B-117, TYPE II, CLASS B (NO WRAP)	2 31/32 X 1 22/32 X 10/32 1.566 CU.	2 29/32 X 1 20/32 X 18/32 2.656 CU.	2 27/32 X 1 18/32 X 22/32 3.055 CU.	2 31/32 X 1 22/32 X 10/32 1.566 CU.	2 29/32 X 1 20/32 X 18/32 2.656 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
	31/32 X 22/32 X 2/32 .07586 1.064	1 5/32 X 28/32 X 2/32 .07586 2.000	1 7/32 X 30/32 X 2/32 .07586 2.420	31/32 X 22/32 X 2/32 .07586 1.064	1 5/32 X 28/32 X 2/32 .07586 2.000

NOTES:

1. Minimum size (2-1/2 X 3) bags were utilized in all tests.
2. No folds were applied to bags in determining final package size.
3. All cube given is in cubic inches.

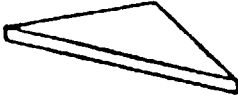



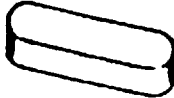
FIGURE 14. Item to unit package size-(2-1/2 X 3 bags)

				
MATERIALS	1-5/8 x 5/8 x 20/32	2 x 1 x 8/32	1-3/4 x 3/4 x 16/32	1-5/8 x 5/8 x 20/32
MIL-B-117, TYPE II, CLASS B (NO WRAP)	2 27/32 x 1 18/32 x 22/32 3.055 CU.	2 31/32 x 1 22/32 x 10/32 1.566 CU.	2 29/32 x 1 20/32 x 18/32 2.656 CU.	2 27/32 x 1 18/32 x 22/32 3.055 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
MIL-B-117, TYPE II, CLASS B MIL-B-121, TYPE II, GR. A, CLASS 2	1 7/32 x 30/32 x 2/32 .06669 2.420	31/32 x 22/32 x 2/32 .06669 1.066	1 5/32 x 28/32 x 2/32 .06669 2.000	1 7/32 x 30/32 x 2/32 .06669 2.420
MIL-B-117, TYPE II, CLASS B MIL-B-121, TYPE II, GR. A, CLASS 2	2 26/32 x 1 17/32 x 25/32 3.363 CU.	2 30/32 x 1 21/32 x 13/32 1.976 CU.	2 28/32 x 1 19/32 x 21/32 3.006 CU.	2 26/32 x 1 17/32 x 25/32 3.363 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
MIL-B-117, TYPE II, CLASS B MIL-B-130, TYPE II	1 6/32 x 29/32 x 5/32 .10706 2.728	30/32 x 21/32 x 5/32 .11189 1.476	1 4/32 x 27/32 x 5/32 .10868 2.350	1 6/32 x 29/32 x 5/32 .10706 2.728
MIL-B-117, TYPE II, CLASS B MIL-B-130, TYPE II	2 25/32 x 1 16/32 x 26/32 3.389 CU.	2 29/32 x 1 20/32 x 14/32 2.066 CU.	2 27/32 x 1 18/32 x 22/32 3.055 CU.	2 25/32 x 1 16/32 x 26/32 3.389 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
MIL-B-117, TYPE II, CLASS C (NO WRAP)	1 5/32 x 28/32 x 6/32 .12565 2.754	29/32 x 20/32 x 6/32 .13273 1.566	1 3/32 x 26/32 x 6/32 .12802 2.399	1 5/32 x 28/32 x 6/32 .12565 2.754
MIL-B-117, TYPE II, CLASS C (NO WRAP)	2 27/32 x 1 18/32 x 22/32 3.055 CU.	2 31/32 x 1 22/32 x 10/32 1.566 CU.	2 29/32 x 1 20/32 x 18/32 2.656 CU.	2 27/32 x 1 18/32 x 22/32 3.055 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
MIL-B-117, TYPE II, CLASS C MIL-B-121, TYPE II, GR. A, CLASS 2	1 7/32 x 30/32 x 2/32 .06669 2.420	31/32 x 22/32 x 2/32 .06669 1.066	1 5/32 x 28/32 x 2/32 .06669 2.000	1 7/32 x 30/32 x 2/32 .06669 2.420
MIL-B-117, TYPE II, CLASS C MIL-B-121, TYPE II, GR. A, CLASS 2	2 26/32 x 1 17/32 x 25/32 3.363 CU.	2 30/32 x 1 21/32 x 13/32 1.976 CU.	2 28/32 x 1 19/32 x 21/32 3.006 CU.	2 26/32 x 1 17/32 x 25/32 3.363 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
MIL-B-117, TYPE II, CLASS C MIL-B-130, TYPE II	1 6/32 x 29/32 x 5/32 .10706 2.728	30/32 x 21/32 x 5/32 .11189 1.476	1 4/32 x 27/32 x 5/32 .10868 2.350	1 6/32 x 29/32 x 5/32 .10706 2.728
MIL-B-117, TYPE II, CLASS C MIL-B-130, TYPE II	2 25/32 x 1 16/32 x 26/32 3.389 CU.	2 29/32 x 1 20/32 x 14/32 2.066 CU.	2 27/32 x 1 18/32 x 22/32 3.005 CU.	2 25/32 x 1 16/32 x 26/32 3.389 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
MIL-B-117, TYPE II, CLASS C (NO WRAP)	1 5/32 x 28/32 x 6/32 .12565 2.754	29/32 x 20/32 x 6/32 .13273 1.566	1 3/32 x 26/32 x 6/32 .12802 2.399	1 5/32 x 28/32 x 6/32 .12565 2.754
MIL-B-117, TYPE II, CLASS C (NO WRAP)	2 27/32 x 1 18/32 x 22/32 3.055 CU.	2 31/32 x 1 22/32 x 10/32 1.566 CU.	2 29/32 x 1 20/32 x 18/32 2.656 CU.	2 27/32 x 1 18/32 x 22/32 3.005 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
	1 7/32 x 30/32 x 2/32 .07586 2.420	31/32 x 22/32 x 2/32 .07586 1.066	1 5/32 x 28/32 x 2/32 .07586 2.000	1 7/32 x 30/32 x 2/32 .07586 2.420

## NOTES:

1. Minimum size (2-1/2 x 3) bags were utilized in all tests.
2. No folds were applied to bags in determining final package size.
3. All cube given is in cubic inches.


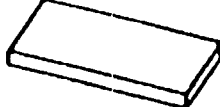
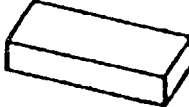
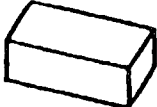
FIGURE 14, Item to unit package size-(2-1/2 X 3 bags)-Continued.

					
MATERIALS	2 X 1 X 8/32	1-3/4 X 3/4 X 16/32	1-5/8 X 5/8 X 20/32	2 X 1 X 8/32	1-3/4 X 3/4 X 16/32
MIL-B-117, TYPE II, CLASS E MIL-B-121, TYPE II, GR. A, CLASS 2	2 30/32 X 1 21/32 X 13/32 1.976 CU.	2 28/32 X 1 19/32 X 21/32 3.006 CU.	2 26/32 X 1 17/32 X 25/32 3.363 CU.	2 30/32 X 1 21/32 X 13/32 1.976 CU.	2 28/32 X 1 19/32 X 21/32 3.006 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
	30/32 X 21/32 X 5/32 .12106 1.476	1 4/32 X 27/32 X 5/32 .11785 2.350	1 6/32 X 29/32 X 5/32 .11623 2.728	30/32 X 21/32 X 5/32 .12106 1.476	1 4/32 X 27/32 X 5/32 .11785 2.350
MIL-B-117, TYPE II, CLASS E MIL-B-130, TYPE II	2 29/32 X 1 20/32 X 14/32 2.066 CU.	2 27/32 X 1 18/32 X 22/32 3.055 CU.	2 25/32 X 1 16/32 X 26/32 3.389 CU.	2 29/32 X 1 20/32 X 14/32 2.066 CU.	2 27/32 X 1 18/32 X 22/32 3.055 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
	29/32 X 20/32 X 6/32 .14190 1.566 CU.	1 3/32 X 26/32 X 6/32 .13719 2.399 CU.	1 5/32 X 28/32 X 6/32 .13482 2.754	29/32 X 20/32 X 6/32 .14190 1.566	1 3/32 X 26/32 X 6/32 .13719 2.399
MIL-B-117, TYPE II, CLASS C (CREPED) (NO WRAP)	2 31/32 X 1 22/32 X 10/32 1.566 CU.	2 29/32 X 1 20/32 X 18/32 2.656 CU.	2 27/32 X 1 18/32 X 22/32 3.055 CU.	2 31/32 X 1 22/32 X 10/32 1.566 CU.	2 29/32 X 1 20/32 X 18/32 2.656 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
	31/32 X 22/32 X 2/32 .05928 1.066	1 5/32 X 28/32 X 2/32 .05928 2.000	1 7/32 X 30/32 X 2/32 .05928 2.420	31/32 X 22/32 X 2/32 .05928 1.006	1 5/32 X 28/32 X 2/32 .05928 2.000
MIL-B-117, TYPE II, CLASS C (CREPED) MIL-B-121, TYPE II, GR. A, CLASS 2	2 30/32 X 1 21/32 X 13/32 1.976 CU.	2 28/32 X 1 19/32 X 21/32 3.006 CU.	2 26/32 X 1 17/32 X 25/32 3.363 CU.	2 30/32 X 1 21/32 X 13/32 1.976 CU.	2 28/32 X 1 19/32 X 21/32 3.006 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
	30/32 X 21/32 X 5/32 .10448 1.476	1 4/32 X 27/32 X 5/32 .10127 2.350	1 6/32 X 29/32 X 5/32 .09965 2.728	30/32 X 21/32 X 5/32 .10448 1.476	1 4/32 X 27/32 X 5/32 .10127 2.350
MIL-B-117, TYPE II, CLASS C (CREPED) MIL-B-130, TYPE II	2 29/32 X 1 20/32 X 14/32 2.066 CU.	2 27/32 X 1 18/32 X 22/32 3.055 CU.	2 25/32 X 1 16/32 X 26/32 3.389 CU.	2 29/32 X 1 20/32 X 14/32 2.066 CU.	2 27/32 X 1 18/32 X 22/32 3.055 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
	29/32 X 20/32 X 6/32 .12532 1.566	1 3/32 X 26/32 X 6/32 .12061 2.399	1 5/32 X 28/32 X 6/32 .11824 2.754	29/32 X 20/32 X 6/32 .12532 1.566	1 3/32 X 26/32 X 6/32 .12061 2.399

## NOTES:

1. Minimum size (2-1/2 x 3) bags were utilized in all tests.
2. No folds were applied to bags in determining final package size.
3. All cube given is in cubic inches.

FIGURE 15. Item to unit package size-(2-1/2 X 3 bags).

				
MATERIALS	1-5/8 X 5/8 X 20/32	2 X 1 X 8/32	1-3/4 X 3/4 X 16/32	1-5/8 X 5/8 X 20/32
MIL-B-117, TYPE II, CLASS E	2 26/32 X 1 13/32 X 22/32	2 30/32 X 1 21/32 X 13/32	2 28/32 X 1 19/32 X 21/32	2 26/32 X 1 17/32 X 25/32
MIL-B-121, TYPE II, GR. A, CLASS 2	3.363 CU.	1.976 CU.	3.006 CU.	3.363 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
	1 6/32 X 29/32 X 5/32 .11623 2.728	30/32 X 21/32 X 5/32 .12106 1.476	1 4/32 X 27/32 X 5/32 .11735 2.350	1 6/32 X 29/32 X 5/32 .11623 2.728
MIL-B-117, TYPE II, CLASS E	2 25/32 X 1 16/32 X 26/32	2 29/32 X 1 20/32 X 14/32	2 27/32 X 1 18/32 X 22/32	2 25/32 X 1 16/32 X 26/32
MIL-B-130, TYPE II	3.389 CU.	2.066 CU.	3.055 CU.	3.389 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
	1 5/32 X 28/32 X 6/32 .13482 2.754	29/32 X 20/32 X 6/32 .14170 1.566	1 3/32 X 26/32 X 6/32 .13719 2.399	1 5/32 X 28/32 X 6/32 .13482 2.754
MIL-B-117, TYPE II, CLASS C (CREPED) (NO WRAP)	2 27/32 X 1 18/32 X 22/32	2 31/32 X 1 22/32 X 10/32	2 29/32 X 1 20/32 X 18/32	2 27/32 X 1 18/32 X 22/32
	3.055 CU.	1.566 CU.	2.656 CU.	3.055 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
	1 7/32 X 30/32 X 2/32 .05928 2.420	31/32 X 22/32 X 2/32 .05928 1.066	1 5/32 X 28/32 X 2/32 .05928 2.000	1 7/32 X 30/32 X 2/32 .05928 2.420
MIL-B-117, TYPE II, CLASS C (CREPED)	2 26/32 X 1 17/32 X 25/32	2 30/32 X 1 21/32 X 13/32	2 28/32 X 1 19/32 X 21/32	2 26/32 X 1 17/32 X 25/32
MIL-B-121, TYPE II, GR. A, CLASS 2	3.363 CU.	1.976 CU.	3.006 CU.	3.363 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
	1 6/32 X 29/32 X 5/32 .09965 2.728	30/32 X 21/32 X 5/32 .10448 1.476	1 4/32 X 27/32 X 5/32 .10127 2.350	1 6/32 X 29/32 X 5/32 .09965 2.728
MIL-B-117, TYPE II, CLASS C (CREPED)	2 25/32 X 1 16/32 X 26/32	2 29/32 X 1 20/32 X 14/32	2 27/32 X 1 18/32 X 22/32	2 25/32 X 1 16/32 X 26/32
MIL-B-130, TYPE II	3.389 CU.	2.066 CU.	3.055 CU.	3.389 CU.
INCREASE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE	SIZE WEIGHT CUBE
	1 5/32 X 28/32 X 6/32 .11824 2.754	29/32 X 20/32 X 6/32 .12532 1.566	1 3/32 X 26/32 X 6/32 .12061 2.399	1 5/32 X 28/32 X 6/32 .11824 2.754

## NOTES:

1. Minimum size (2-1/2 x 3) bags were utilized in all tests.
2. No folds were applied to bags in determining final package size.
3. All cube given is in cubic inches.

FIGURE 15. Item to unit package size-(2-1/2 X 3 bags)-Continued.

MIL-B-121, TYPE II, GR. A, CL. 2 MIL-B-130, TYPE II PPP-B-636, OPF MIL-B-117, TYPE I, CLASS E PPP-B-636, RSC	$7 \frac{3}{8} \times 7 \frac{1}{4} \times 3 \frac{3}{8}$ 180.457 cu. in.	$8 \frac{3}{8} \times 6 \frac{1}{4} \times 3 \frac{3}{8}$ 176.658 cu. in.	$9 \frac{3}{8} \times 7 \frac{1}{4} \times 3 \frac{3}{8}$ 229.395 cu. in.			
INCREASE	Size Weight Cube	Size Weight Cube	Size Weight Cube			
MIL-B-121, TYPE II, GR. A, CL. 2 PPP-B-291, TYPE II PPP-B-636, OPF MIL-B-117, TYPE I, CLASS E PPP-B-636, RSC	$7 \frac{7}{8} \times 7 \frac{1}{2} \times 3 \frac{5}{8}$ 214.102 cu. in.	$8 \frac{7}{8} \times 6 \frac{1}{2} \times 3 \frac{5}{8}$ 209.117 cu. in.	$9 \frac{7}{8} \times 7 \frac{1}{2} \times 3 \frac{5}{8}$ 260.477 cu. in.			
INCREASE	Size Weight Cube	Size Weight Cube	Size Weight Cube			
MIL-B-121, TYPE II, GR. A, CL. 2 PPP-B-636, RSC MIL-B-117, TYPE I, CLASS E PPP-B-636, RSC	$1 \frac{7}{8} \times 1 \frac{1}{2} \times 1 \frac{5}{8}$ 11.2779 ounces 142.102 cu. in.	$1 \frac{7}{8} \times 1 \frac{1}{2} \times 1 \frac{5}{8}$ 10.4302 ounces 139.117 cu. in.	$1 \frac{7}{8} \times 1 \frac{1}{2} \times 1 \frac{5}{8}$ 13.0643 ounces 172.477 cu. in.			
MIL-B-121, TYPE II, GR. A, CL. 2 PPP-B-636, RSC MIL-B-117, TYPE I, CLASS E PPP-B-636, RSC	$7 \frac{3}{8} \times 7 \frac{1}{4} \times 3 \frac{1}{2}$ 183.914 cu. in.	$8 \frac{3}{8} \times 6 \frac{1}{4} \times 3 \frac{1}{2}$ 183.201 cu. in.	$9 \frac{3}{8} \times 7 \frac{1}{4} \times 3 \frac{1}{2}$ 237.891 cu. in.	$9 \frac{3}{8} \times 7 \frac{1}{4} \times 3 \frac{1}{2}$ 373.828 cu. in.	$11 \frac{3}{8} \times 9 \frac{1}{4} \times 7 \frac{1}{2}$ 778.477 cu. in.	$13 \frac{3}{8} \times 5 \frac{1}{4} \times 5$ 364.215 cu. in.
INCREASE	Size Weight Cube	Size Weight Cube	Size Weight Cube	Size Weight Cube	Size Weight Cube	Size Weight Cube
MIL-B-130, TYPE II PPP-B-636, RSC MIL-B-117, TYPE I, CLASS E PPP-B-636, RSC	$1 \frac{5}{8} \times 1 \frac{1}{4} \times 1 \frac{1}{2}$ 10.3164 ounces 111.914 cu. in.	$1 \frac{5}{8} \times 1 \frac{1}{4} \times 1 \frac{1}{2}$ 9.3327 ounces 113.201 cu. in.	$1 \frac{5}{8} \times 1 \frac{1}{4} \times 1 \frac{1}{2}$ 12.440 ounces 141.891 cu. in.	$1 \frac{5}{8} \times 1 \frac{1}{4} \times 1 \frac{1}{2}$ 14.8947 ounces 181.828 cu. in.	$1 \frac{5}{8} \times 1 \frac{1}{4} \times 1 \frac{1}{2}$ 25.459 ounces 298.477 cu. in.	$1 \frac{7}{8} \times 1 \frac{1}{4} \times 1 \frac{7}{8}$ 14.449 ounces 172.215 cu. in.
MIL-B-130, TYPE II (2 Wraps) PPP-B-636, RSC MIL-B-117, TYPE I, CLASS E PPP-B-636, RSC	$7 \frac{3}{8} \times 7 \frac{1}{4} \times 3 \frac{1}{2}$ 183.914 cu. in.	$8 \frac{3}{8} \times 6 \frac{1}{4} \times 3 \frac{1}{2}$ 183.201 cu. in.	$9 \frac{3}{8} \times 7 \frac{1}{4} \times 3 \frac{1}{2}$ 237.891 cu. in.	$9 \frac{3}{8} \times 7 \frac{1}{4} \times 3 \frac{1}{2}$ 373.828 cu. in.	$11 \frac{3}{8} \times 9 \frac{1}{4} \times 7 \frac{1}{2}$ 778.477 cu. in.	$13 \frac{3}{8} \times 5 \frac{1}{4} \times 5$ 364.215 cu. in.
INCREASE	Size Weight Cube	Size Weight Cube	Size Weight Cube	Size Weight Cube	Size Weight Cube	Size Weight Cube
MIL-B-130, TYPE II (2 Wraps) PPP-B-636, RSC MIL-B-117, TYPE I, CLASS E PPP-B-636, RSC	$1 \frac{7}{8} \times 1 \frac{1}{2} \times 1 \frac{3}{4}$ 12.089 ounces 149.4821 cu. in.	$1 \frac{7}{8} \times 1 \frac{1}{2} \times 1 \frac{3}{4}$ 11.2014 ounces 146.329 cu. in.	$1 \frac{7}{8} \times 1 \frac{1}{2} \times 1 \frac{3}{4}$ 14.371 ounces 181.734 cu. in.	$1 \frac{7}{8} \times 1 \frac{1}{2} \times 1 \frac{3}{4}$ 17.675 ounces 233.859 cu. in.	$1 \frac{7}{8} \times 1 \frac{1}{2} \times 1 \frac{3}{4}$ 29.870 ounces 394.297 cu. in.	$2 \frac{3}{8} \times 1 \frac{1}{2} \times 1 \frac{1}{4}$ 17.1977 ounces 223.079 cu. in.
MIL-B-121, TYPE II, GR. A, CL. 2 MIL-B-130, TYPE II PPP-B-636, RSC MIL-B-117, TYPE I, CLASS E PPP-B-636, RSC	$7 \frac{3}{8} \times 7 \frac{1}{4} \times 3 \frac{1}{2}$ 183.914 cu. in.	$8 \frac{3}{8} \times 6 \frac{1}{4} \times 3 \frac{1}{2}$ 183.201 cu. in.	$9 \frac{3}{8} \times 7 \frac{1}{4} \times 3 \frac{1}{2}$ 237.891 cu. in.	$9 \frac{3}{8} \times 7 \frac{1}{4} \times 3 \frac{1}{2}$ 373.828 cu. in.	$11 \frac{3}{8} \times 9 \frac{1}{4} \times 7 \frac{1}{2}$ 778.477 cu. in.	$13 \frac{3}{8} \times 5 \frac{1}{4} \times 5$ 364.215 cu. in.
INCREASE	Size Weight Cube	Size Weight Cube	Size Weight Cube	Size Weight Cube	Size Weight Cube	Size Weight Cube
MIL-B-121, TYPE II, GR. A, CL. 2 MIL-B-291, TYPE II PPP-B-636, RSC MIL-B-117, TYPE I, CLASS E PPP-B-636, RSC	$1 \frac{3}{8} \times 1 \frac{1}{4} \times 1 \frac{1}{2}$ 11.2932 ounces 111.914 cu. in.	$1 \frac{3}{8} \times 1 \frac{1}{4} \times 1 \frac{1}{2}$ 10.260 ounces 113.201 cu. in.	$1 \frac{3}{8} \times 1 \frac{1}{4} \times 1 \frac{1}{2}$ 13.6125 ounces 141.891 cu. in.	$1 \frac{3}{8} \times 1 \frac{1}{4} \times 1 \frac{1}{2}$ 16.5109 ounces 181.828 cu. in.	$1 \frac{5}{8} \times 1 \frac{1}{4} \times 1 \frac{1}{2}$ 28.3361 ounces 298.477 cu. in.	$1 \frac{5}{8} \times 1 \frac{1}{4} \times 1$ 16.0474 ounces 172.215 cu. in.
MIL-B-121, TYPE II, GR. A, CL. 2 MIL-B-291, TYPE II PPP-B-636, RSC MIL-B-117, TYPE I, CLASS E PPP-B-636, RSC	$7 \frac{7}{8} \times 7 \frac{1}{2} \times 3 \frac{5}{8}$ 221.484 cu. in.	$8 \frac{7}{8} \times 6 \frac{1}{2} \times 3 \frac{5}{8}$ 216.329 cu. in.	$9 \frac{7}{8} \times 7 \frac{1}{2} \times 3 \frac{5}{8}$ 277.734 cu. in.	$9 \frac{7}{8} \times 7 \frac{1}{2} \times 3 \frac{5}{8}$ 425.859 cu. in.	$11 \frac{7}{8} \times 9 \frac{1}{2} \times 7 \frac{5}{8}$ 874.297 cu. in.	$14 \frac{3}{8} \times 5 \frac{1}{2} \times 5 \frac{1}{4}$ 415.079 cu. in.
INCREASE	Size Weight Cube	Size Weight Cube	Size Weight Cube	Size Weight Cube	Size Weight Cube	Size Weight Cube
MIL-B-121, TYPE II, GR. A, CL. 2 MIL-B-291, TYPE II PPP-B-636, RSC MIL-B-117, TYPE I, CLASS E PPP-B-636, RSC	$1 \frac{7}{8} \times 1 \frac{1}{2} \times 1 \frac{3}{4}$ 12.3926 ounces 149.484 cu. in.	$1 \frac{7}{8} \times 1 \frac{1}{2} \times 1 \frac{3}{4}$ 11.490 ounces 146.329 cu. in.	$1 \frac{7}{8} \times 1 \frac{1}{2} \times 1 \frac{3}{4}$ 14.7553 ounces 181.734 cu. in.	$1 \frac{7}{8} \times 1 \frac{1}{2} \times 1 \frac{3}{4}$ 18.1774 ounces 233.859 cu. in.	$1 \frac{7}{8} \times 1 \frac{1}{2} \times 1 \frac{3}{4}$ 30.764 ounces 394.297 cu. in.	$2 \frac{3}{8} \times 1 \frac{1}{2} \times 5 \frac{1}{4}$ 17.6945 ounces 223.079 cu. in.

NOTE: 4 X 4 X 12 item utilized. 4 1/4 X 4 1/4 X 12 1/2 inner carton, and 4 7/8 X 4 5/8 X 13 1/4 outer carton.

FIGURE 16. Item to unit package size-(method 1A-14).

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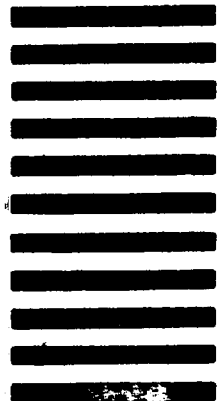
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