

Packaging and Marking Guide For DoD



Defense Contract Management Agency

March 2014

FOREWORD

This Booklet has not been officially adopted by DoD. It is prepared as an informational guide for familiarization purposes only and is not intended to take the place of contractual requirements, specifications or regulations. The information contained herein is derived from current government packaging documents, pamphlets and technical manuals and is used for instructional purposes only.

March 2014

Originally Compiled by
Ted Hollanders,
DCMA Packaging Specialist (Retired)
Revised & Updated by the
DCMAO-LSP Packaging Group
Packaging.Inbox@dcma.mil

Locations of Packaging Requirements in Solicitations & Contracts

Section A - Solicitation / Contract Form

Section B - Supplies & Services

Section C - Description/Specs/Statement of Work

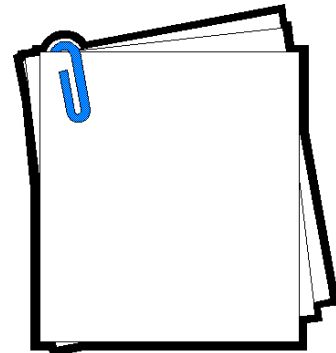
Section D - Packaging & Marking

Section E - Inspection & Acceptance

Section F - Deliveries or Performance

Section I - Contract Clauses

Section J - Attachments



- CID's (Commercial Item Descriptions)
- Military or Federal Specifications
- Aperture Cards & Drawings
- Special Packaging Instructions
- DLA Master Solicitations
- FAR & DFARS clauses
- Product Specifications
- Military Standard Drawings (MS)
- Industry Standards (ASTM's)
- Packaging Requirement Codes

* Review entire contract/solicitation

HAZARDOUS MATERIALS



In addition to Contractual Requirements -
MUST be Packaged in accordance with the
appropriate Modal Regulation:

- Title 49 CFR for Land
- IMO/IMDG for Water
- ICAO/ IATA for Commercial Air
- AFMAN 24-204_IP* for Military Air

*INTERSERVICE: [DLAI 4145.3 / TM 38-250 /](#)
[NAVSUP PUB 505 / MCO P4030.19J](#)

Must be marked and labeled in accordance with the
appropriate Modal Regulations and when specified,
MIL-STD-129.

In case of conflicting information, the appropriate
Modal Regulations take precedence.

ASTM D-3951

Standard Practice for Commercial Packaging
(Latest Revision is ASTM D3951-10)

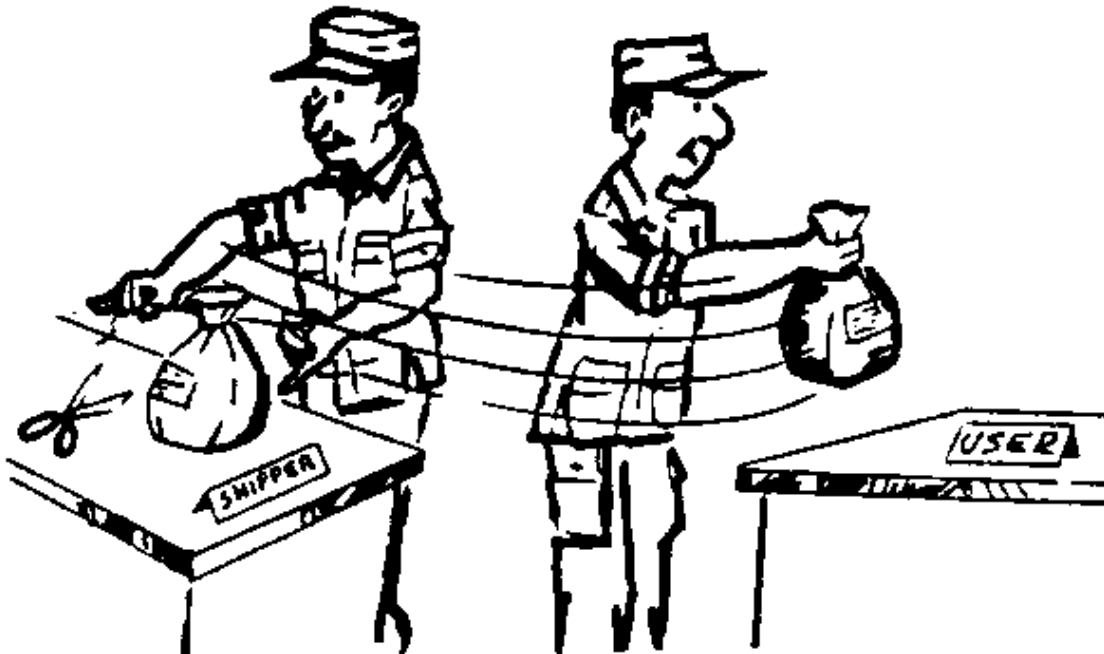
Some items which packaging IAW ASTM D-3951 may be appropriate include but are not limited to:

Items Intended for Immediate Use

Items for fulfilment of Not-Mission Capable Supply

Items Intended for Depot Consumption

Shipped small parcel post (CONUS only), Not for Stock



For shipments to DoD, the marking shall be IAW MIL-STD-129 (ASTM D3951-10)

The decision to utilize commercial packaging is made by packaging technical personnel at the Procuring (buying) activity prior to RFQ or solicitation.

MIL-STD-2073-1E

w/CHANGE 1

(7 January 2011)

Standard Practice for Military Packaging

Applies to items for which military packaging is required to meet operational demands. These items include, but are not limited to items:

- (a) Delivered during wartime for deployment with or sustainment to operational units.
- (b) Requiring reusable containers.
- (c) Intended for delivery-at-sea.
- (d) Intended to enter the Defense Transportation and Distribution System and when storage is expected to exceed 6 months.

APPENDICES

- APPENDIX A - DEVELOPMENT OF MILITARY PACKAGING REQUIREMENTS
- APPENDIX B - FACTORS & FORMULAE ESTABLISHING MILITARY PACKAGING QUP & ICQ
- APPENDIX C - CONTAINERS
- APPENDIX D - DEVELOPMENT OF MILITARY PACKAGING REQUIREMENTS FOR KITS (PARTS & MODIFICATION)
- APPENDIX E - MILITARY PACKAGING DATA FORMS
- APPENDIX F - MILITARY PACKAGING DESIGN VALIDATION PROVISIONS
- APPENDIX G - QUALITY ASSURANCE PROVISIONS
- APPENDIX H - PROCEDURES FOR COMPLIANCE WITH CONTAINER DESIGN RETRIEVAL SYSTEM (CDRS) REQUIREMENTS.
- APPENDIX J - MILITARY PACKAGING REQUIREMENT CODES

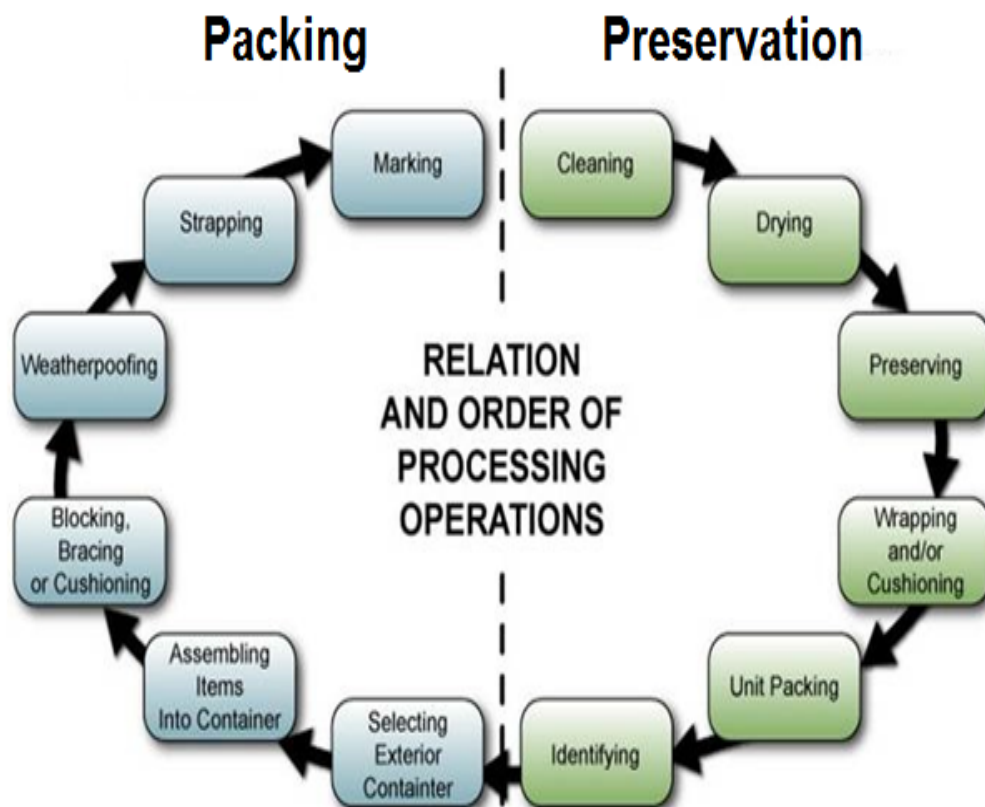
(Some contracts cite MIL-STD-2073-1D)

Military Packaging

Military Packaging. A means of specifying the military preservation and packing that a given item requires to ensure that it is not degraded during shipment and storage.

Military Preservation. Application of materials and/or methods designed to protect an item during shipment, handling, indeterminate storage and distribution to consignees worldwide.

Military Packing. Application of any exterior protective methods, materials, or devices to assure the integrity of the preserved item as follows: (next slide)



Military Packing

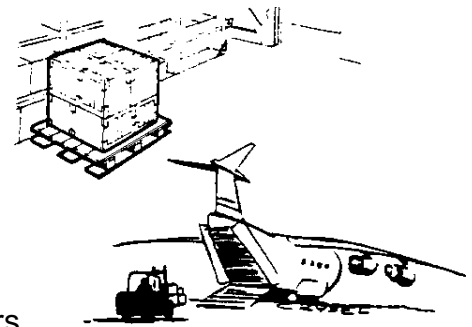
Military Packing. Application of any exterior protective methods, materials, or devices to assure the integrity of the preserved item as follows:

LEVEL A

Protection required to meet the most severe worldwide shipment, handling and storage conditions.

A Level A pack must, in tandem with the applied method of preservation, be capable of protecting material from the effects of direct exposure to extremes of climate, terrain, and operational and transportation environments.

Examples of containers used for Level A packing requirements include, but are not limited to, overseas type wood boxes, and plastic and metal reusable containers.

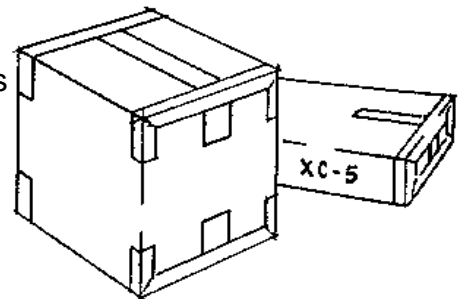


LEVEL B

Protection required to meet moderate worldwide shipment, handling and storage conditions..

A Level B pack must, in tandem with the applied preservation, to be capable of protecting material not directly exposed to extremes off climate, terrain, and operational and transportation environments.

Examples of containers used for Level B packing requirements include, but are not limited to, domestic wood crates, weather-resistant fiberboard containers, fast pack containers, weather-resistant fiber drums, and weather-resistant paper and multi-wall shipping sacks.



Minimal packing requirements. When anticipated logistics paths indicate that items requiring military preservation, as outlined in this standard, will not be exposed to shipping environments more severe than those normally encountered in the commercial distribution system, military packing requirements need not be implemented. Acceptable minimal packing requirements for shipments of this nature are listed in table J-IXb.

FIVE BASIC METHODS OF MILITARY PRESERVATION

Method 10 - Physical protection

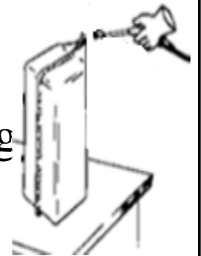
Method 20 - Preservative coating only

Method 30 - Waterproof protection

Method 40 - Watervaporproof protection

Method 50 - Watervaporproof protection with desiccant

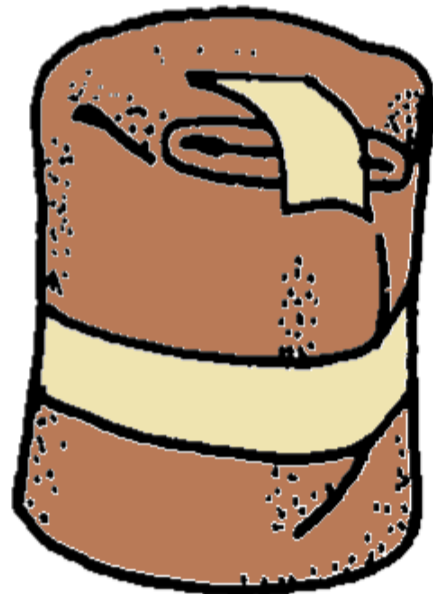
- Protection from physical damage and mechanical malfunction is required for all methods of preservation
- When methods require chipboard or fiberboard containers within the bag, the corners and edges of the containers shall be blunted
- When a transparent unit pack is specified, the preliminary wrapping shall also be transparent
- Preliminary wrapping materials in contact with any item coated with a preservative shall be greaseproof
- When flexible bags are used, the volume of trapped air within the bag shall be kept to a minimum by compressing the bag around the contents, or by carefully drawing a vacuum inside the bag
- When specific methods require using a bag or container, preliminary wrapping, cushioning or other dunnage material shall be applied as necessary to protect the item, the bag, and the container from all projections or sharp edges of the item as well as to restrict movement of the item within the unit pack.



Method 10

Physical Protection

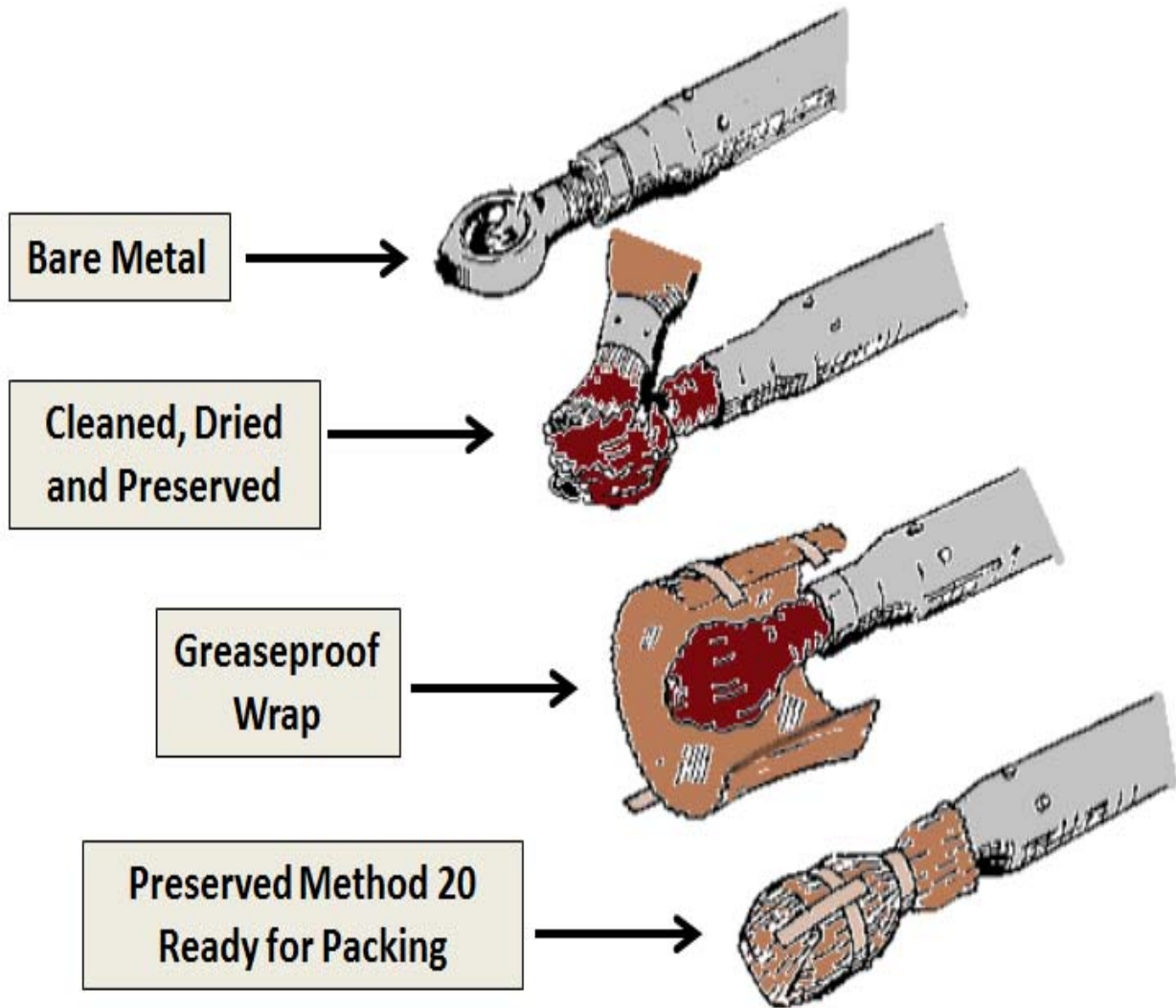
Types of items to be preserved Method 10:



Unpreserved items shall be provided protection from physical damage and mechanical malfunction. Cushioning materials, dunnage, blocking and bracing shall be applied as required to protect the items and the enclosing media and restrict the movement of the item within the container.

Method 20

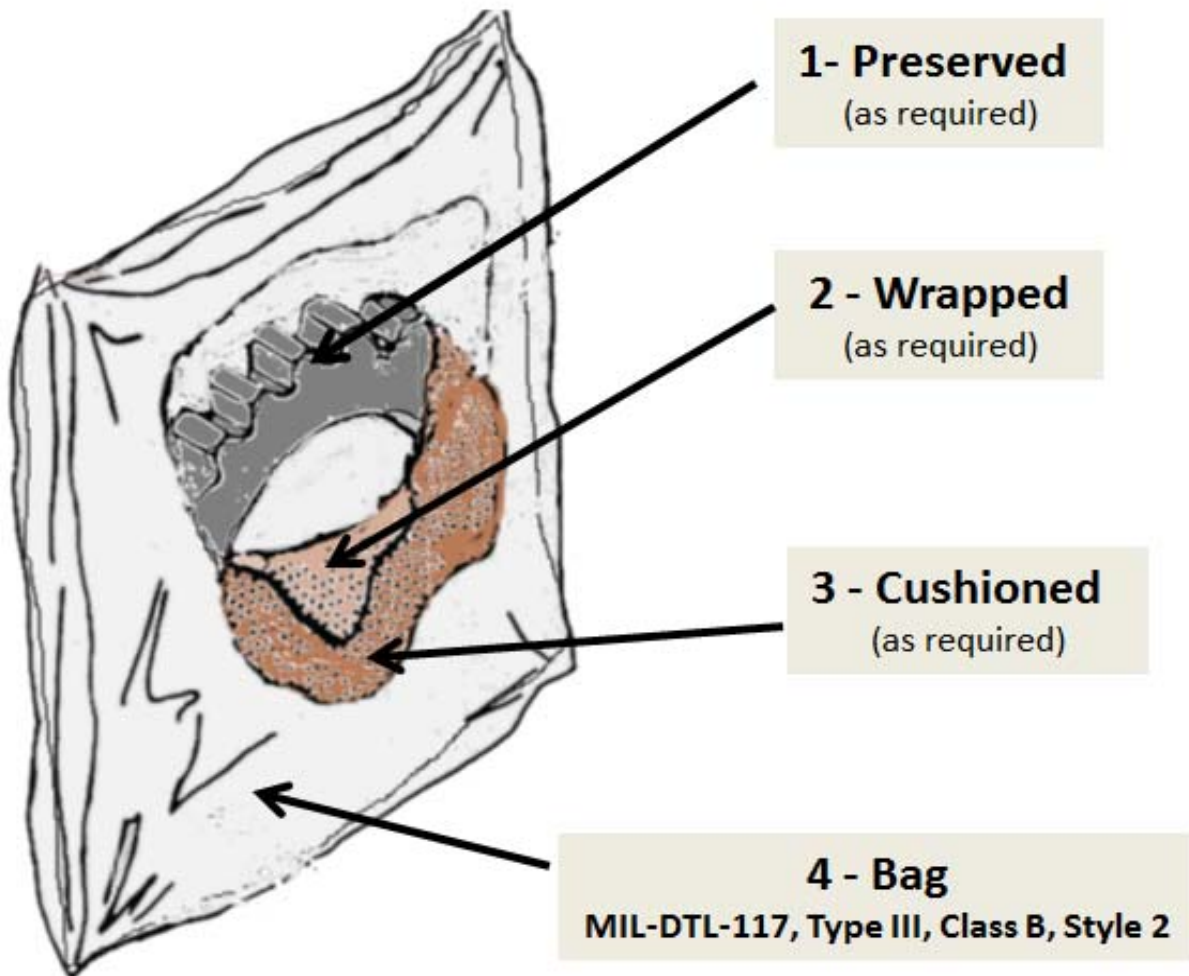
Physical Protection with Preservative (with greaseproof wrap, as required)



- Preservative shall be applied directly after cleaning and drying
- Contact preservative coated items shall be wrapped in material conforming to MIL-PRF-121 or QQ-A-1876

Method 31

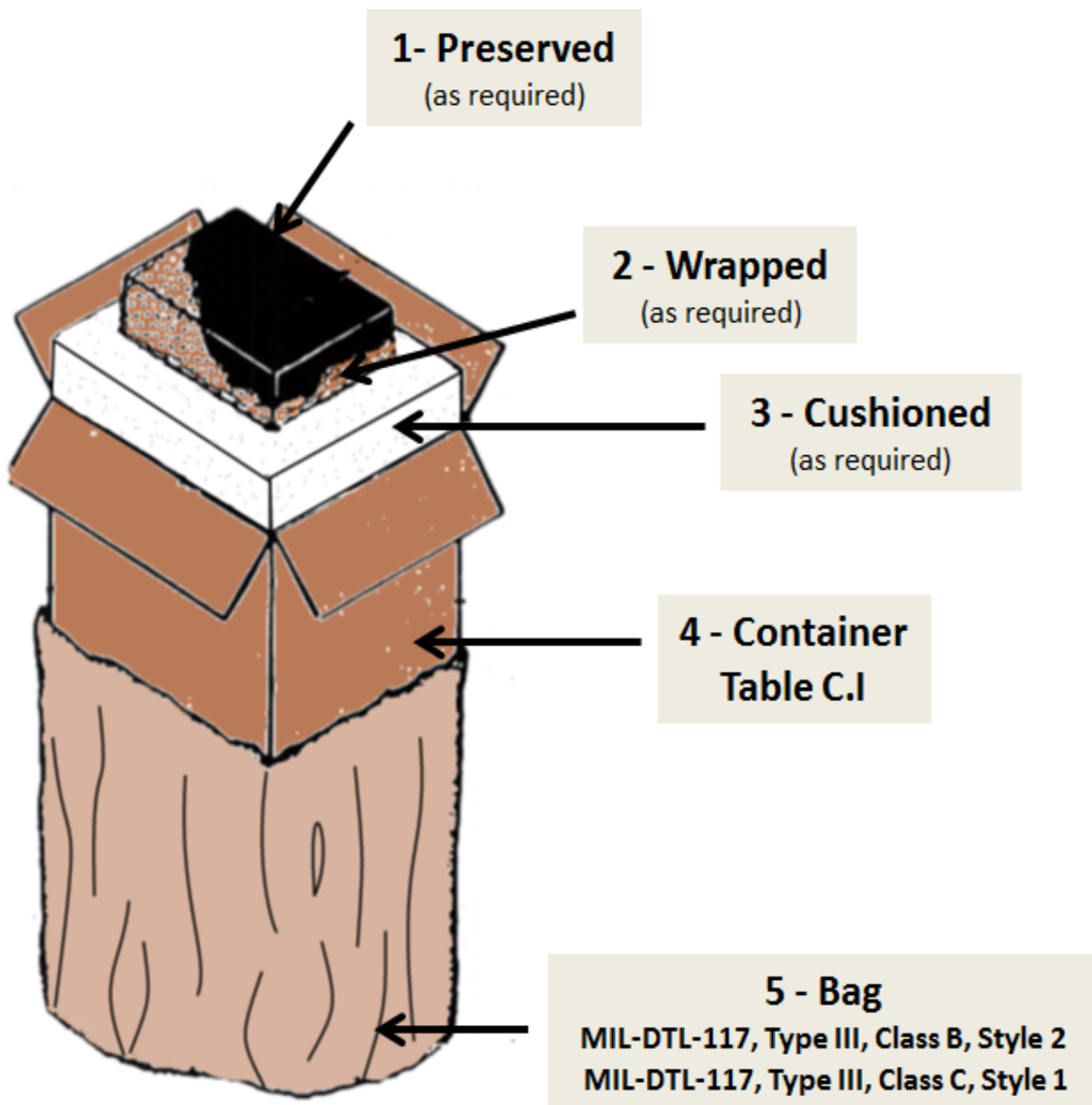
Waterproof Bag, Heat Sealed



When specified in the contract or order, a carton or box shall be required to effect the unit container and the primary cushioning specified in the contract or order shall be placed between the outside of the bag and the inside of the carton or box

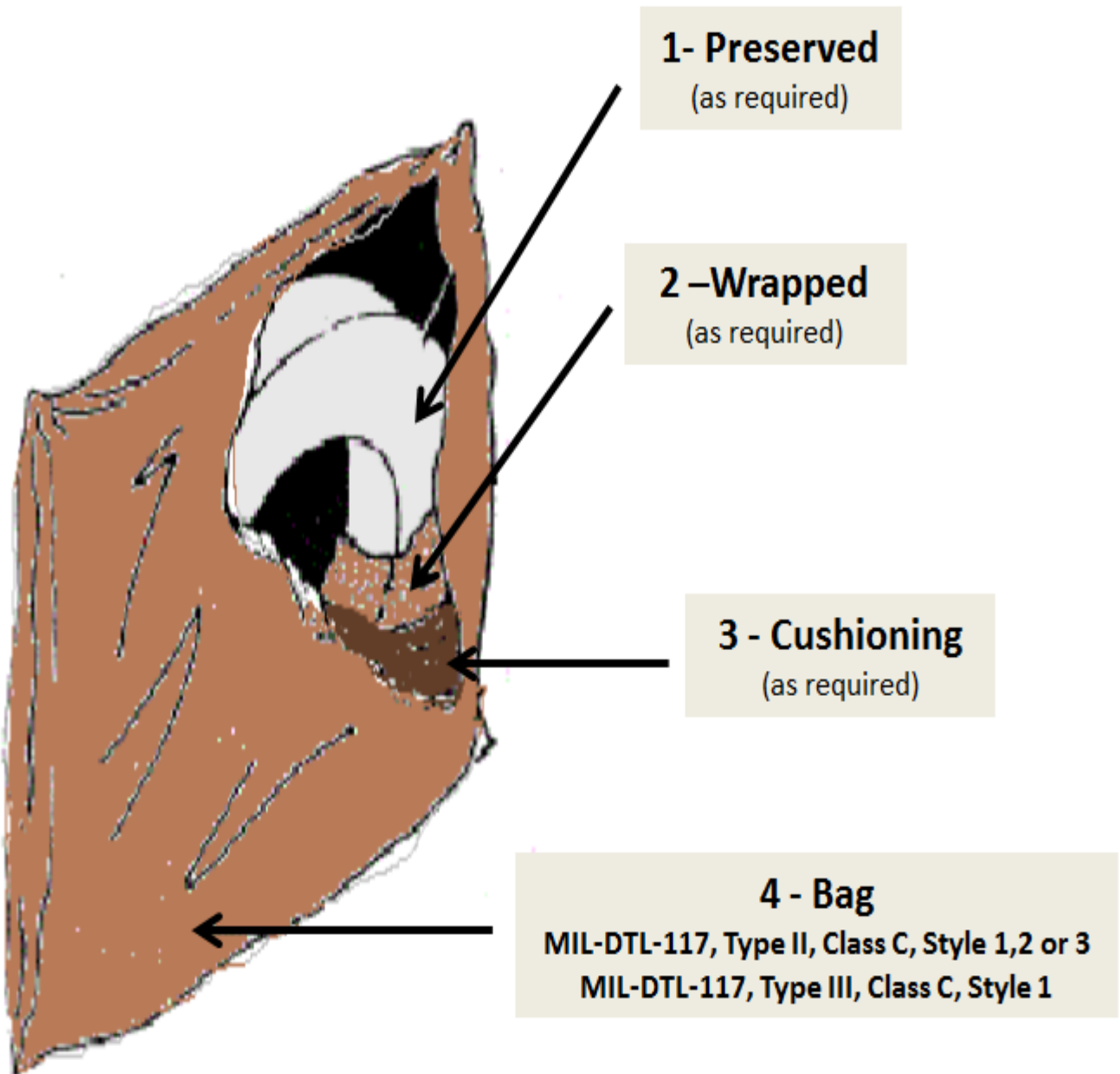
Method 32

Container, Waterproof Bag, Heat Sealed



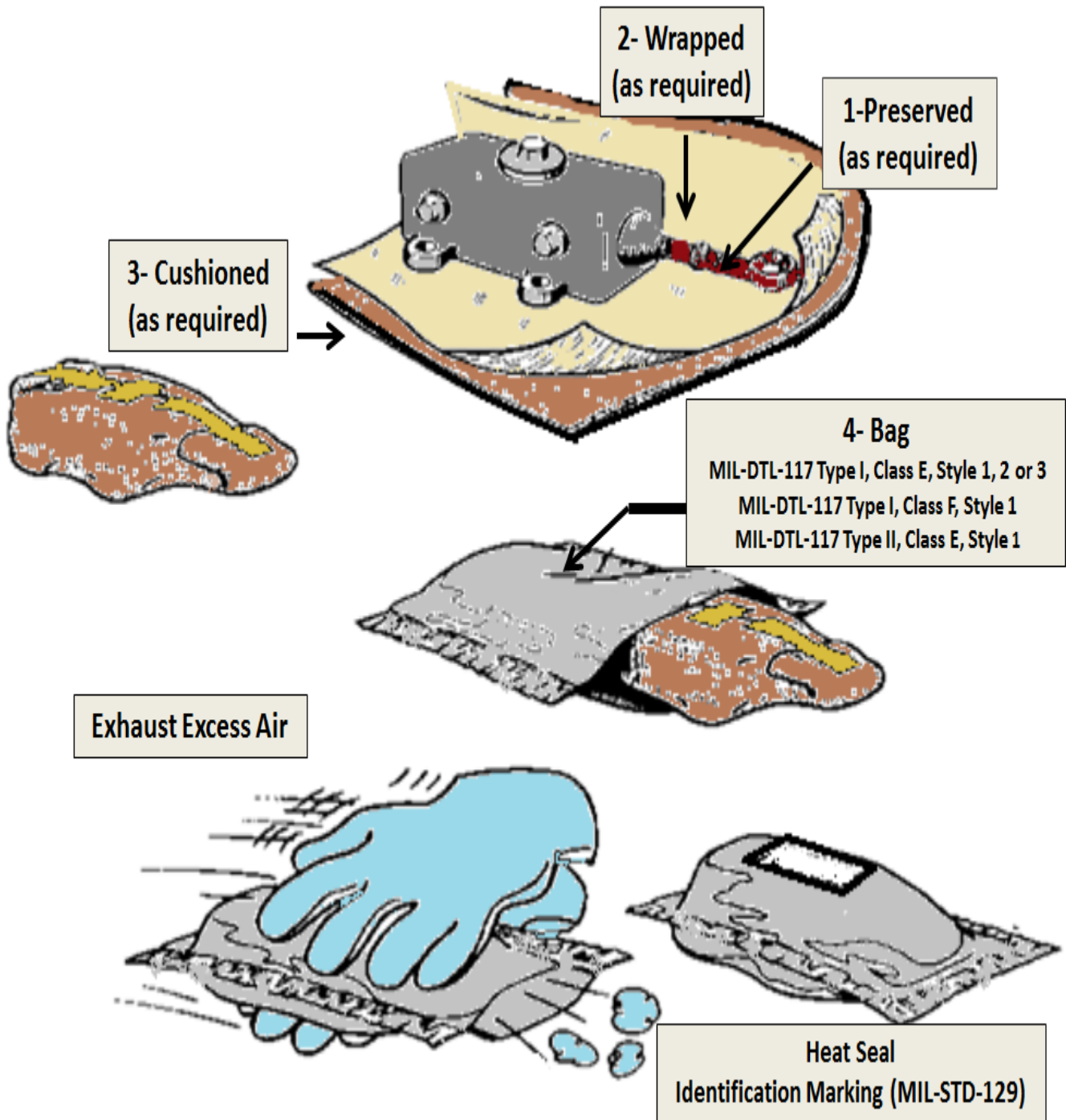
Method 33

Greaseproof – Waterproof bag, heat sealed



Method 41

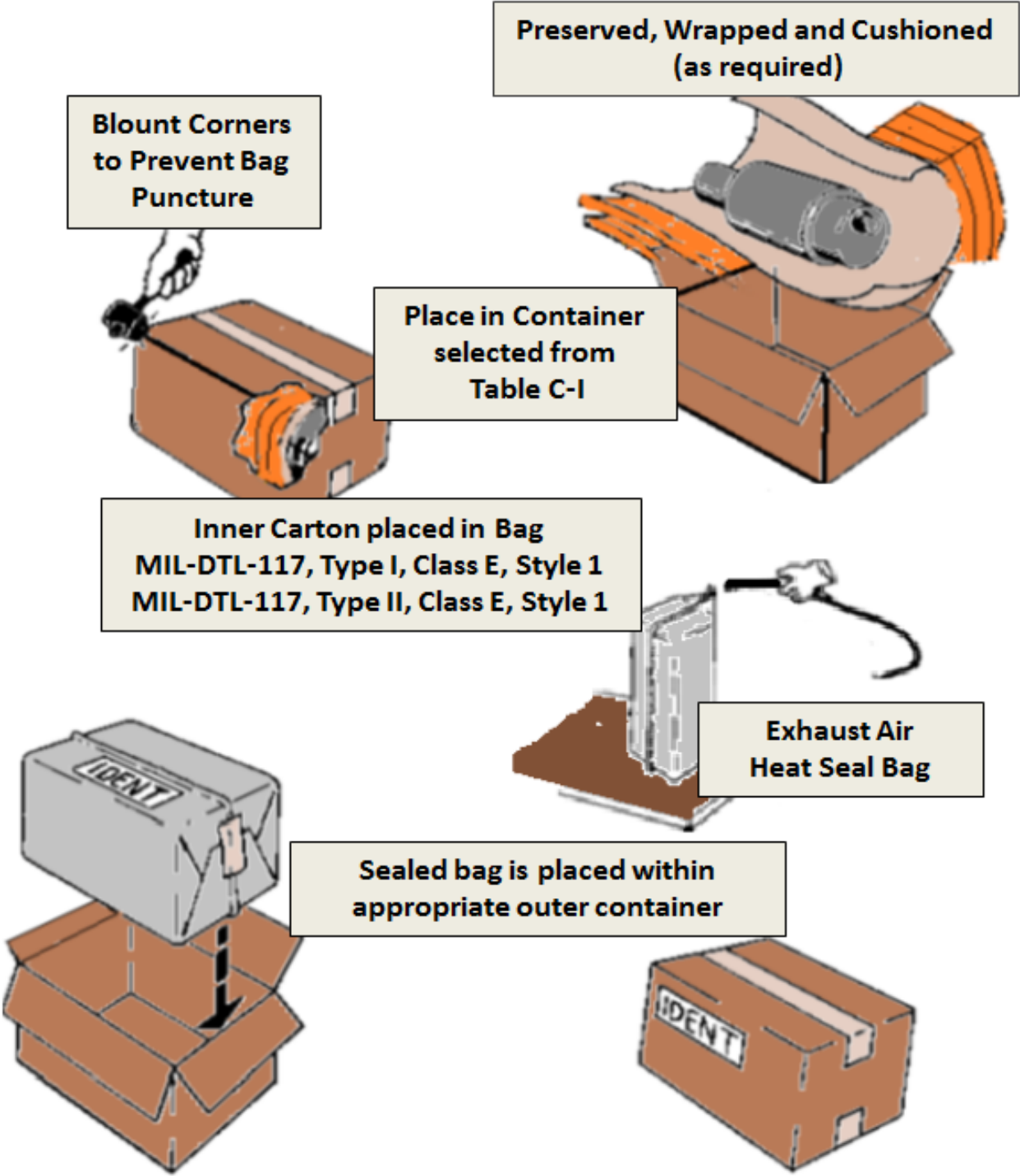
Watervaporproof bag, heat sealed



For electrostatic protection refer to 5.2.4.1.
5.2.4.1 - ESDS items shall be preserved in accordance with table J-Ia,
Code "GX"

Method 42

Container, Watervaporproof bag, heat sealed, Container

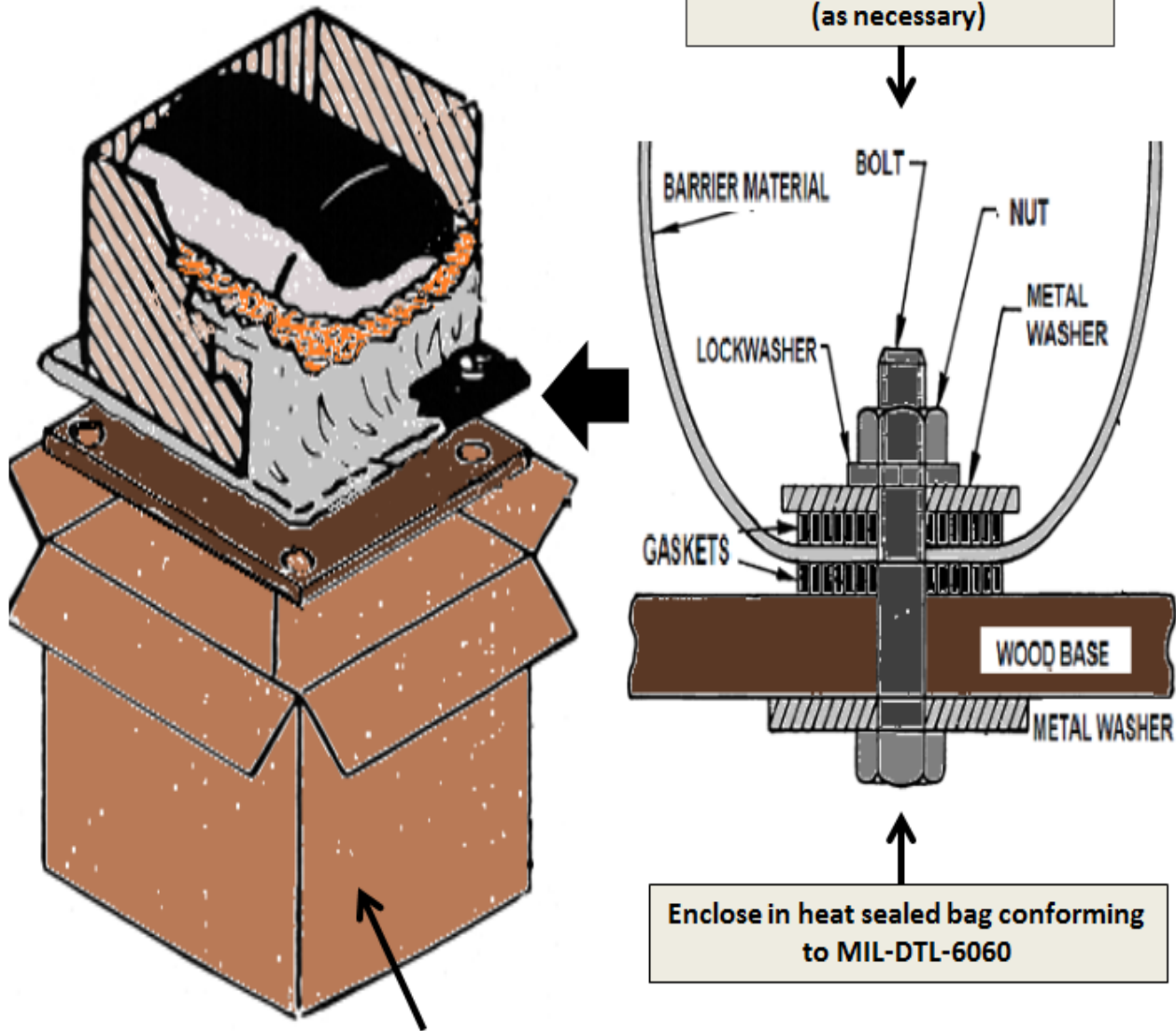


Method 43

Floating Watervaporproof Bag, Heat Sealed

Preserved, Wrapped and Cushioned
(as required)

Anchored or Shock Mounted
(as necessary)



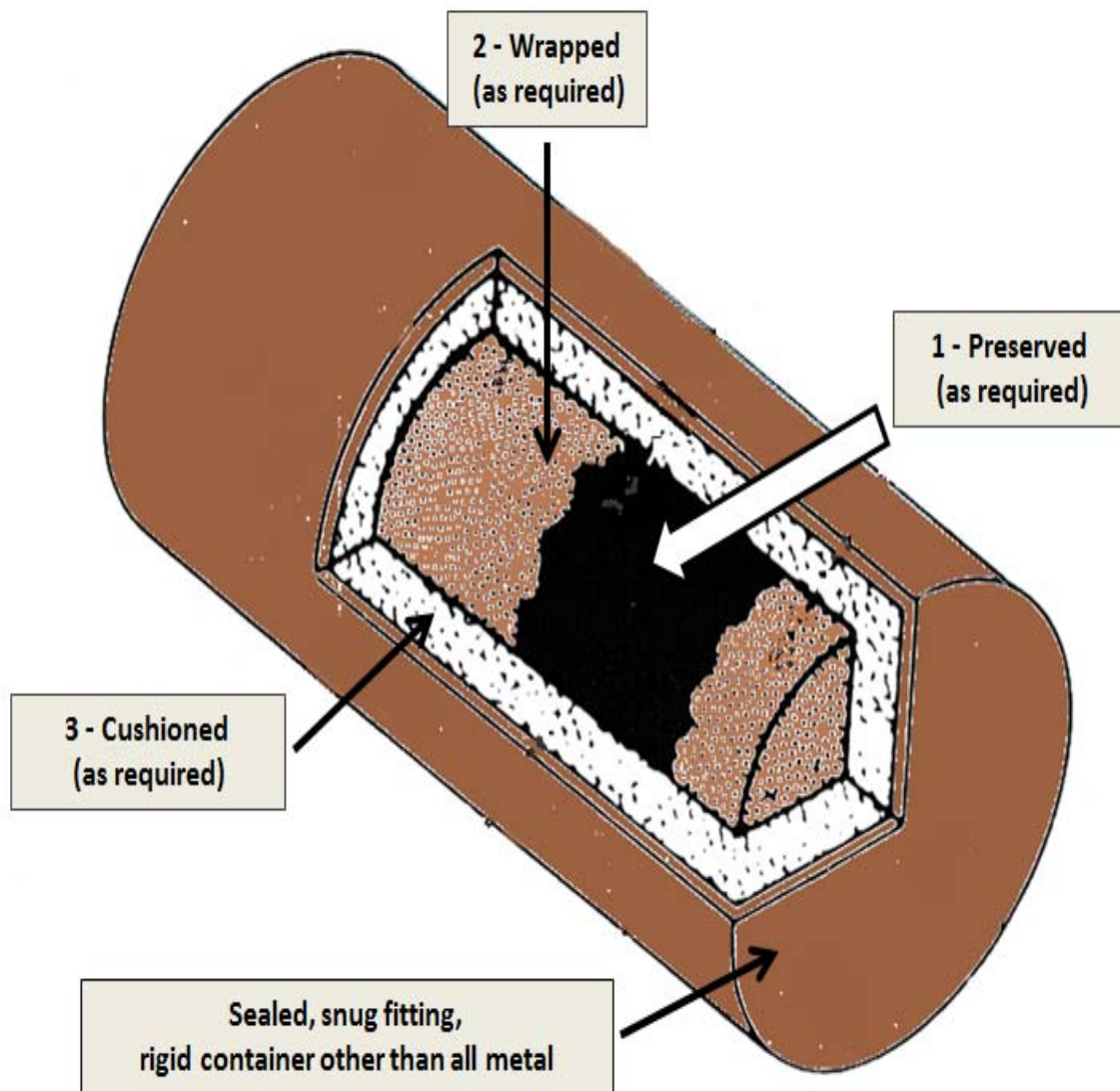
Place in appropriate container

Enclose in heat sealed bag conforming
to MIL-DTL-6060

When the outer container becomes the shipping container, it shall be marked as a shipping container in accordance with MIL-STD-129; the bag shall be marked as a unit pack in accordance with MIL-STD-129

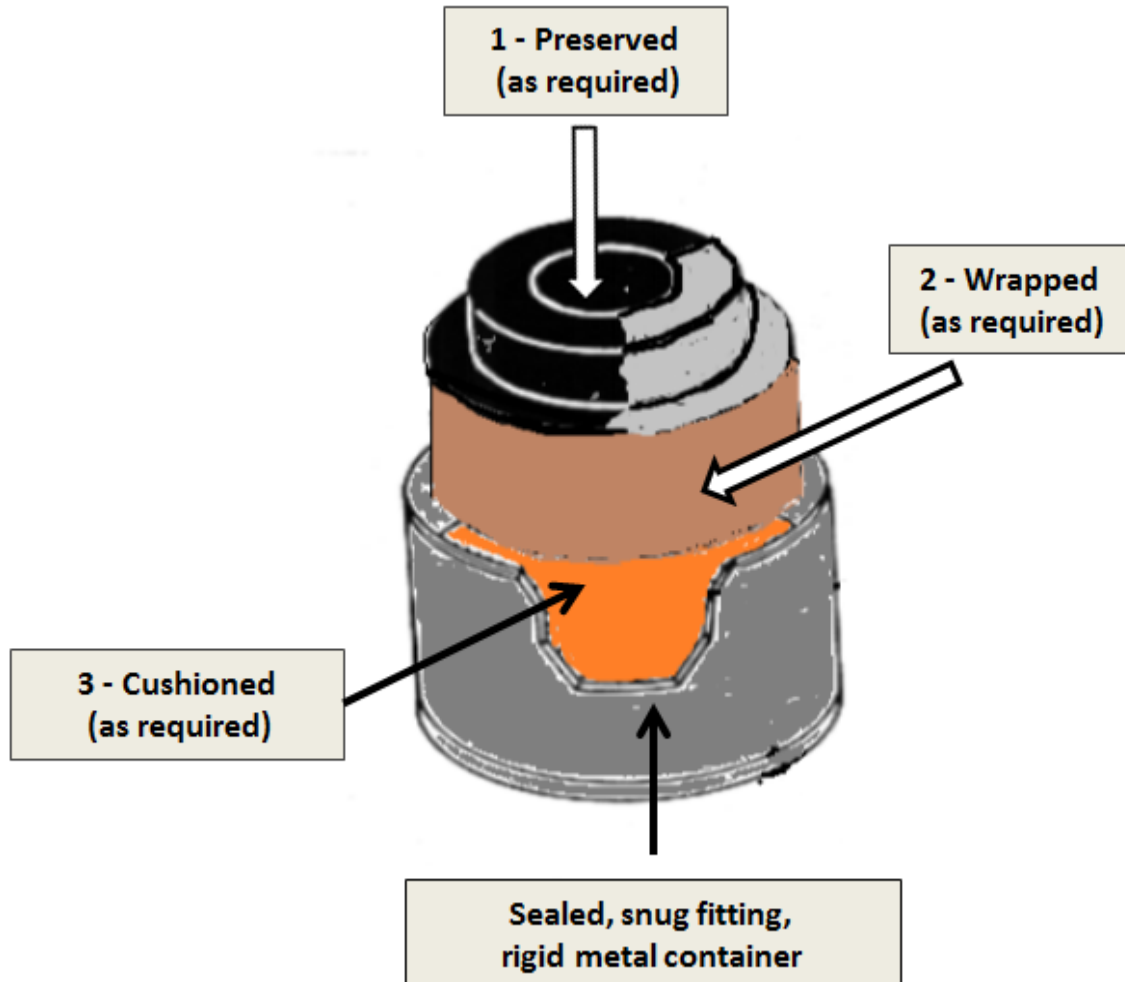
Method 44

Rigid Container (other than metal)



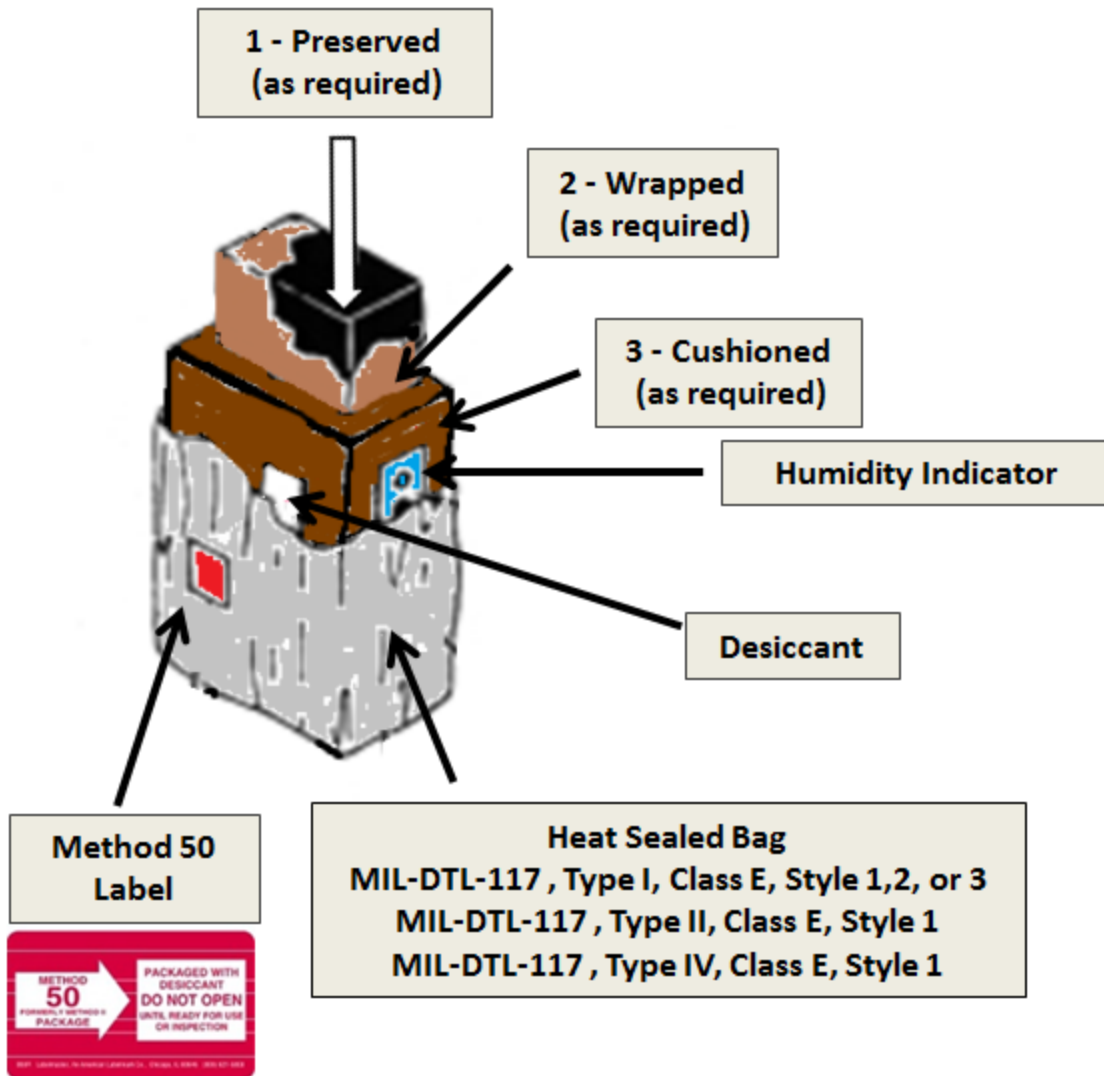
Method 45

Rigid Metal Container, Sealed



Method 51

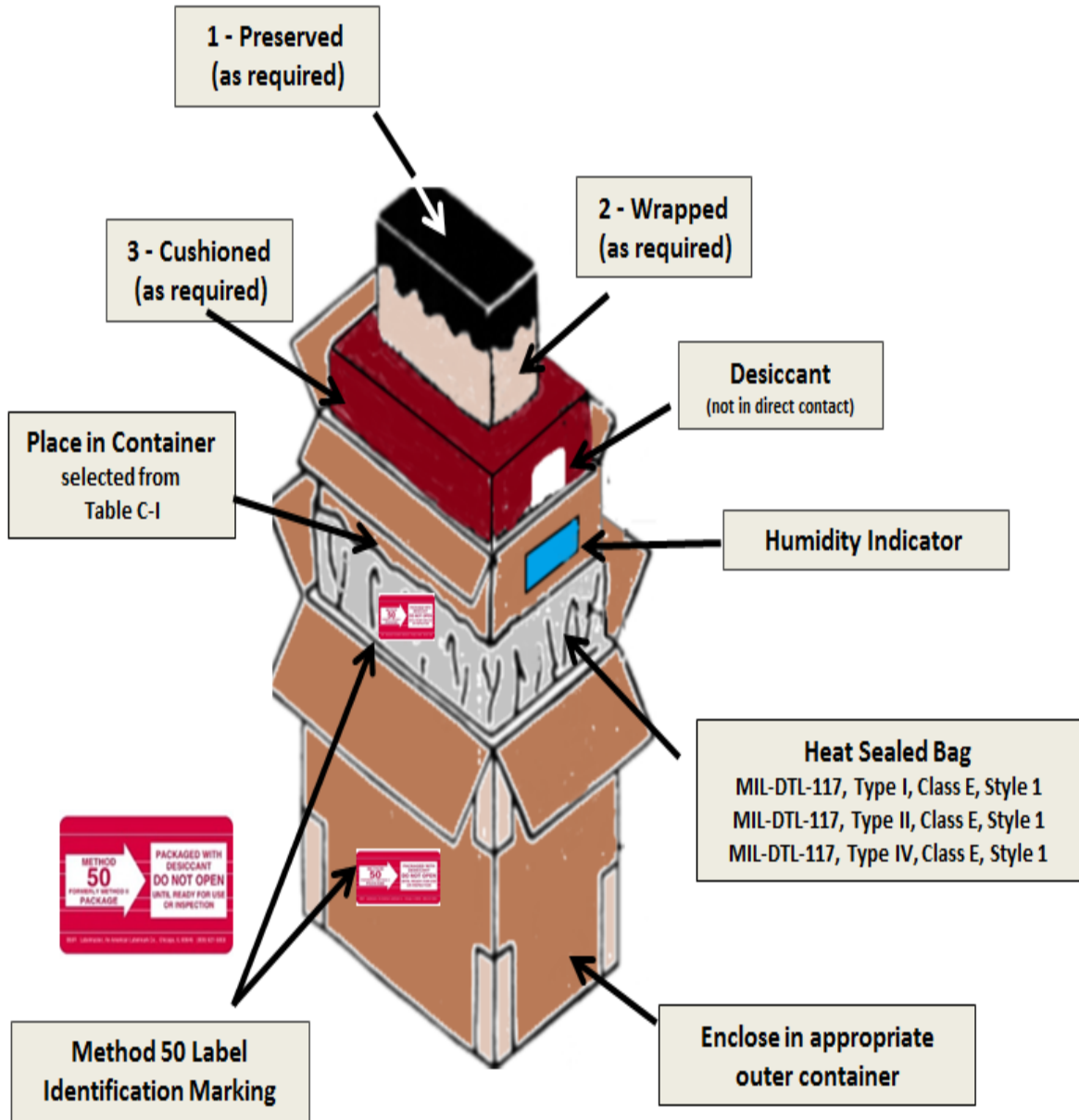
Watervaporproof Bag with Desiccant, Heat Sealed



- The bag size shall be of sufficient surface area to permit two subsequent resealings.
- The humidity indicator shall be firmly secured directly behind the inspection window or immediately within the closure seal of the container.

Method 52

Container, Watervaporproof Bag w/Desiccant, Heat Sealed, Container



Under no circumstances shall desiccant be permitted to come in direct contact with critical surfaces of the enclosed item.

Sample Worksheet

MIL-STD-2073-1E Worksheet				
PURPOSE: To translate packaging requirements from Orders or Contracts which specify Packaging Requirements Codes in accordance with MIL-STD-2073-1E				
Contractor:			Contract Number:	
Procuring Office:			Item Description:	
HEADING	DETAIL	TABLE	CODE	REQUIREMENT
QUP	Quantity per Unit Pack	Page 142 Para. J.4.3		
ICQ	Intermediate Container Quantity	Page 143 Para J.4.11		
MOP	Method Preservation	J.I or J.Ia		
CD	Cleaning and Drying	J.II		
PM	Preservative Material	J.III		
WM	Wrap Material	J.IV		
CUD	Cushioning / Dunnage Material	J.V		
CT	Cushioning Thickness	J.VI		
UC	Unit Pack Container	J.VII		
IC	Intermediate Container	J.VII		
UCL	Unit Container Level	J.VIII		
OPI	Optional Procedure Indicator	J.VIIIa		
PACK	Level A Military Packing	J.IX		
PACK	Level B Military Packing	J.IXa		
PACK	Minimal Packing	J.IXb		
SP MK	Special Marking	J.X		

MIL-STD-20731E(1)

PACKAGING REQUIREMENT CODES

(PRC)

QUP (QUANTITY PER UNIT PACK)

Para. J.4.3

States the quantity per unit pack in the clear up to 999. BLK will be used for Bulk and ZZZ for Special Requirements listed in supplemental data or drawings

ICQ (INTERMEDIATE CONTAINER QUANTITY)

Para J.4.11

When intermediate containers are used, the number of unit packs per intermediate containers up to 100 will be listed in the clear. Other codes may be AAA, XXX or ZZZ.

PRESERVATION

Table J.I, & J.Ia

Method of Preservation will be a two (2) digit code derived from the tables. Table J.I information is for the preservation methods and submethods established by Para. 5.2.3 Table J.Ia codes are for packaging procedures which are regularly used and require a more detailed description than allowed by the basic code and yet do not require the use of special packaging instructions.

CLEANING & DRYING PROCEDURES

Table J.II

This is a one (1) digit code sometimes shown as CLN/DRY or C/D.

PRESERVATIVE MATERIAL

Table J.III

A two (2) digit code. Refers to the type of material to be used to coat the item. Table J-III lists contact preservative material in alphanumeric order.

WRAPS

Table J.IV

A two (2) digit code. This is a listing of what the item will be wrapped in after it has been properly preserved.

CUSHIONING AND DUNNAGE

Table J.V

A two (2) digit code. Codes listing the cushioning and dunnage material that will be utilized after the item has been wrapped. This material will usually be placed between the wrapped item and the inside of the unit container

CUSHIONING THICKNESS

Table J.VI

One (1) digit code listing the minimum thickness that is required between the unit and the unit container in any one direction.

UNIT CONTAINER

Table J.VII

Two (2) digit code listing the type of container into which the item will be placed.

INTERMEDIATE CONTAINER

Table J.VII

Two (2) digit code listing the type of container that is to be used if an intermediate container is necessary.

UNIT CONTAINER LEVEL

Table J.VIII

One (1) digit:

"O" - Denotes the unit container is not an acceptable shipping container.

"A" or "B" - Denotes if the container is an acceptable shipping container and what the highest level of protection will be afforded by this container.

"Z" - Indicates that the container requires special considerations (air only, inside storage only, etc.)

OPI (Optional Procedure Indicator)

Table J.VIIIa

"A" is indicated if packaging is in accordance with a specification or a special packaging instruction.

"M" indicates that all packaging data is mandatory for compliance and no substitutions are permitted.

"O" indicates that options can be exercised as to specific method of preservation or DoD approved packaging materials to be used. However, basic preservation method shall be retained and unit package dimensions shall not be increased by more than one inch. Equal or better protection shall be given the item and there shall be no increase in the package cost.

MILITARY PACKING

Table J.IX & IXa

One (1) digit code. Indicates the type of shipping container for MILITARY packing.

MINIMAL PACKING

Table J.IXb

One (1) digit code. Indicates the type of shipping container for Minimal packing.

SPECIAL MARKINGS

Table J.X

Two (2) digit code. If more than one code or a combination of codes not included in the table must be specified, "ZZ" will be annotated which indicates that supplemental data is listed elsewhere.

Some contracts will show the following information:

UNIT PACK WEIGHT

Five (5) digit numerical code. It shows the actual unit pack weight in the clear to the nearest on tenth of a pound. The decimal point does not show.

UNIT PACK SIZE

LGTH WPTH DPTH

Four (4) digit numerical code. This code shows the outside dimensions in the clear to the nearest tenth of an inch in the order of length, width and depth (or height). The decimal points do not show. (Example: 0035 = 3 1/2")

UNIT PACK CUBE

WH CUB 1000th

Four (4) digits for the whole cube and three (3) digits in the 1000th column. These seven (7) numbers indicate the actual cube of the unit pack to the nearest one thousandth of a cubic foot up to 9,999.999 cubic feet.

Packaging Code Lookup Tool
https://camphill.leidos.com/code_lookup.nsf/codecheck

MIL-STD-2073-1E(1)

Paragraph 5.7 Quality Assurance Provisions. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all quality assurance requirements as specified in Appendix G

Quality Assurance Provisions

Appendix G

G.4 Preservation Inspections

G.4.1 Visual Preservation Examinations

G.4.2 Leakage Test (Method 5009 *)

- Vacuum Retention Technique
- Submersion or Immersion Technique
- Pneumatic Pressure Technique
- Hot Water Technique
- Squeeze Technique

G.4.3 Heat-Sealed Seam Test (Method 2024*)

G.5 Packing Inspections

G.5.1 Examination procedures (Refer to MIL-STD-2073-1E(1) for complete list)

* See MIL-STD-3010 for additional information on test methods and documentation format.

Inspection Provisions

Table G-I. Preservation Inspection Provisions.

* Some of the included visual inspections are:

- Item contaminated by handling after cleaning.
- Contaminated wiping cloths or compressed air used.
- Preservative not as specified.
- Excessive Preservative.
- Wrap not as specified.
- Cushioning material or thickness not as specified.
- Interior unit container corners not blunted.
- Excessive looseness in unit container.
- Weight & cube of unit pack exceeds maximum allowable.
- Incorrect QUP
- Marking omitted, incorrect or illegible 2/3/4/

2/ For methods 42 and 52, unit pack marking of MIL-STD-129 shall be applied to the barrier bag as well as the outer container.

3/ When a box or container is used to effect the unit pack of methods 31, 33, 41 and 51, unit pack markings of MIL-STD-129 shall be applied to the barrier bag as well as the box specified to effect the unit pack.

4/ When the unit pack is also used as the shipping container, then the markings applicable for shipment shall be applied to the exterior container in accordance with MIL-STD-129.

Table G-II. Leakage and heat-sealed seam test provisions.

Table provides method/submethod and required leak and or heat-sealed seam test.

* See MIL-STD-2073-1, Table G.I for complete list.

Package Markings

There are four types of Basic Markings

1. Identification Marking

NSN - (National Stock Number)
CAGE Code
PN - (Part #)
Nomenclature (Not always required on exterior containers)
Quantity and unit of issue
Contract number
Military Method and date of unit preservation
Gross Weight (Exterior containers)
Shelf Life Information (if applicable)
Serial Numbers (if applicable)

2. Identification Bar Code Markings

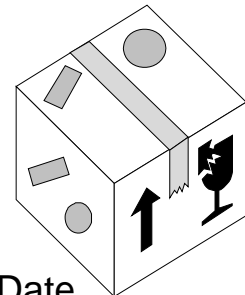
NSN (& Serial Number) for unit and intermediate packs
NSN, Contract number, CAGE, CLIN, Shipment Number (& Serial Number) on exterior shipping containers

3. Address Markings

Uses Military Shipping Label (MSL).
Transportation Control Number (TCN), DODAAC of Ultimate Consignee, and Piece Number must be bar coded when shipment is destined into the Defense Transportation System
2D Bar Coding of MSL Information, TCMD data and line item supply data.

4. Special Markings

Hazardous Material
Set Marking, Project Code
Warranty, Manufactured, Cured or Assembled Date
Expiration, Inspection or Pack Date
Arrows, Fragile, Special Handling, etc.
UID and RFID



Unit & Intermediate Container Label Example



2910004567416

2910-00-456-7416

CAGE 57685

PN 341

CARBURETOR

1 EA

DAA625-03-C-1056

M41 02/08

MFD DATE 01/08

EXP DATE 01/09

SER NO 1157



1157

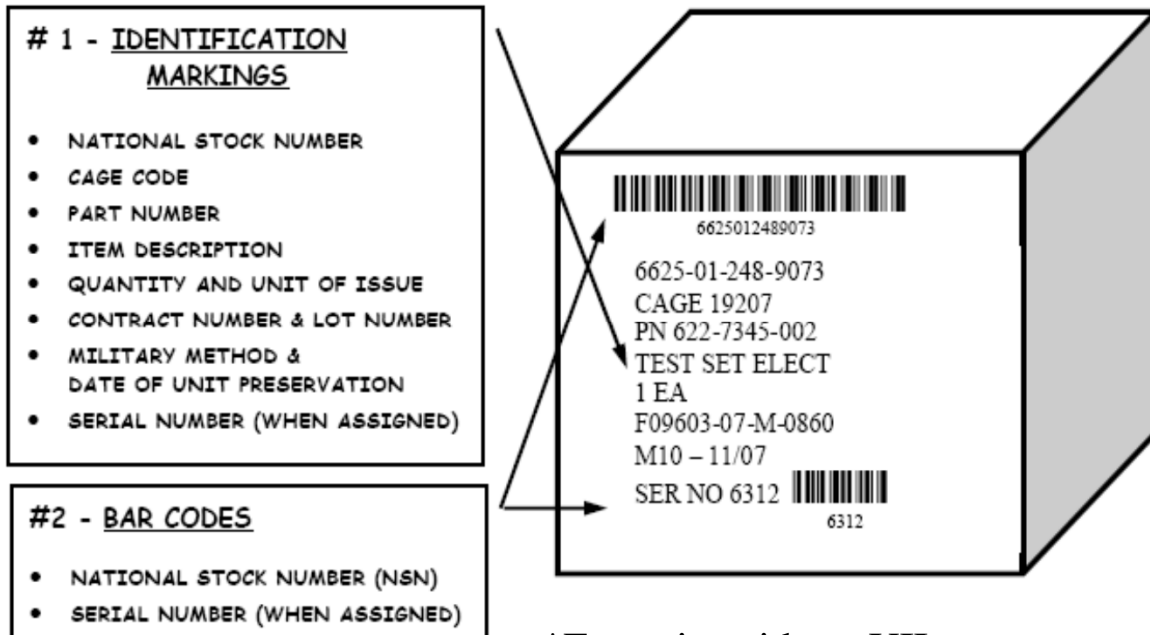
*MFD and EXP Date for Shelf Life Items and Serial Numbers only if Applicable.

ID DATA
INCLUDES UII(s)



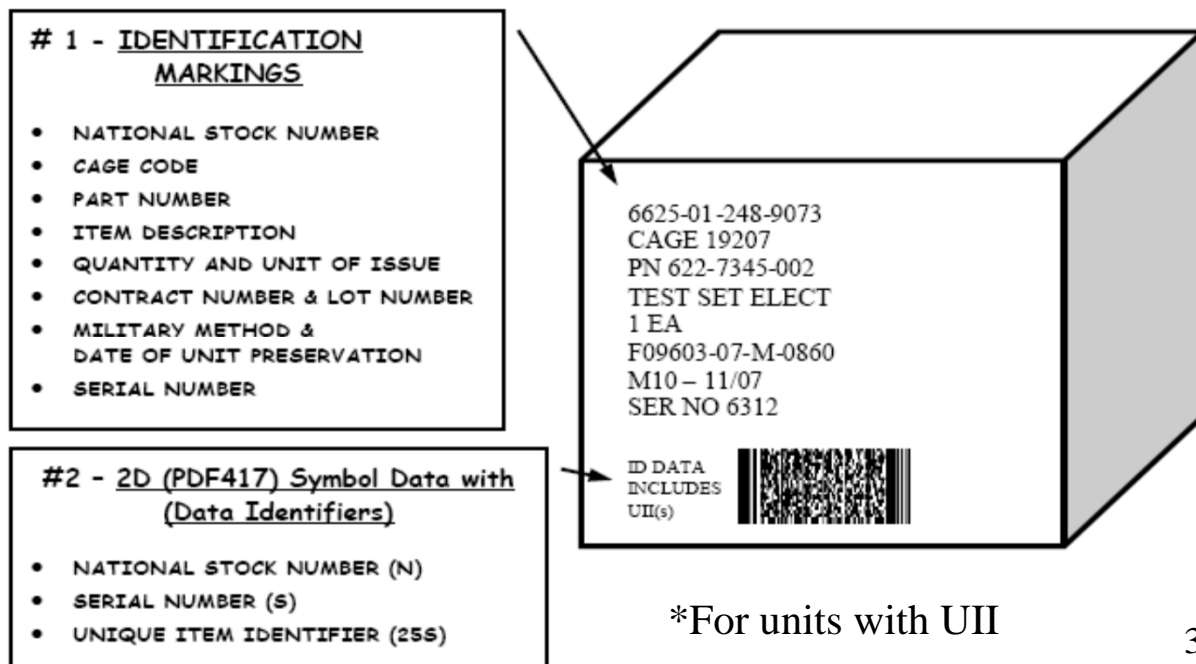
*Application of the linear bar codes is not required when the 2D (PDF417) identification symbol is used.

Unit & Intermediate Containers with linear (Code 39) bar codes



*For units without UII

Unit & Intermediate Containers with 2D (PDF417) symbol*



*For units with UII

Exterior Container Label Example



2910004567416



0001AA



DAA62507M1056



BET0001Z



57685

2910-00-456-7416

CAGE 57685

PN 341

3 EA

DAA625-07-M-1056

M41 02/08

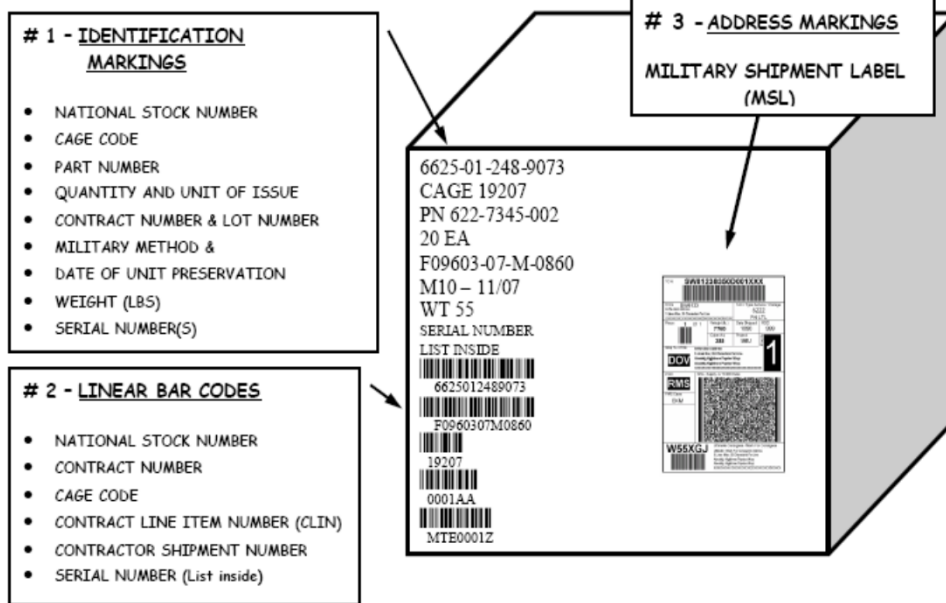
WT 30

ID DATA
INCLUDES UII(s)



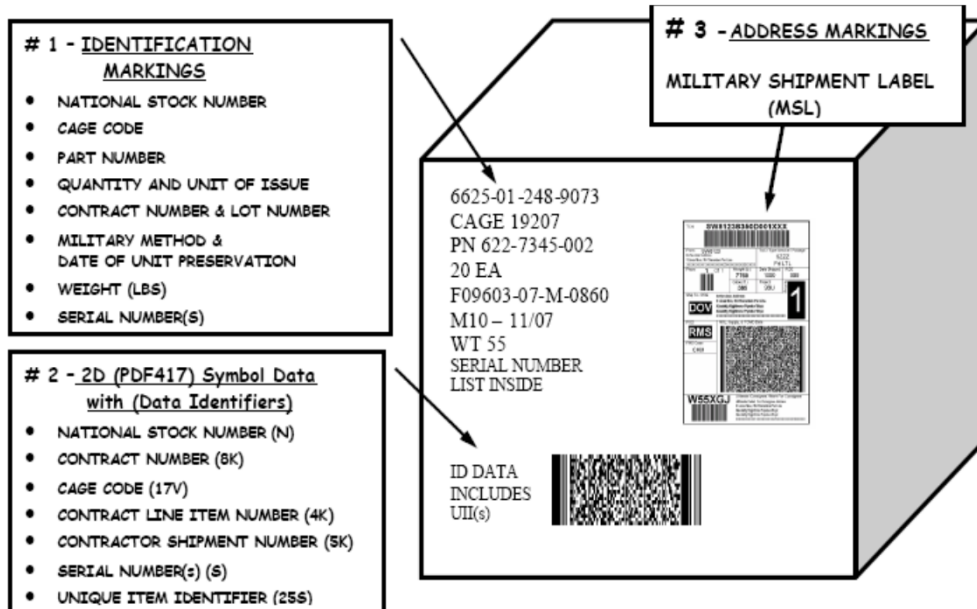
*Application of the linear bar codes is not required when the 2D (PDF417) identification symbol is used.

Exterior Containers with linear (Code 39) bar codes



*For containers without UII

Exterior Containers with 2D (PDF417) symbol*



*For containers with UII

Military Shipping Label (MSL)

Sample – CONUS Shipment

TCN S1501A4202A453XXX			
			
From ATGM 4700 WEST 10TH ST INDIANAPOLIS IN 46222-3277		TAC / Type Service / Postage 73342 FRT LTL	
Piece 1 OF 1 	Weight (lb.) 1210	Date Shipped 07/20/04	Project
	Cube (ft.) 60	RDD 340	FMS Case
Priority 3	MSL, Supply & TCMD Data 		
POD			
Ship To / POE		TRANSPORTATION OFFICER DDSP NEW CUMBERLAND FACILITY BUILDING MISSION DOOR 113-143 NEW CUMBERLAND PA 17070-5001	
Ultimate Consignee / Mark For Consignee W25G1U			
		TRANSPORTATION OFFICER DDSP NEW CUMBERLAND FACILITY BUILDING MISSION DOOR 113-134 NEW CUMBERLAND PA 17070-5001	

The label contains Address Markings

The 2D Bar Code contains Address Markings and Inventory Control Information

DTR Part II Appendix L Paragraph O provides information on the construct of a TCN when there is no TCN and no Requisition Document Number (MILSTRIP/DLMS) identified in the contract/purchase order/delivery order.

Special Markings

- **Shelf-life**
- **Project Code**
- **Fragile/ Delicate**
- **Method 50**
- **Expedited Handling**
- **Hazardous Materials**



Special Markings

Shelf-life

Shown below identification data on unit, intermediate and exterior containers

- **TYPE I (non-extendable):**
MFD DATE 10/01
EXP DATE 10/06
- **TYPE II (extendable):**
ASSEMBLED DATE 10/01
INSP/TEST DATE 10/04
- **RUBBER or ELASTOMER (TYPE I OR II):**
CURED DATE 4Q01
INSP/TEST DATE 4Q05

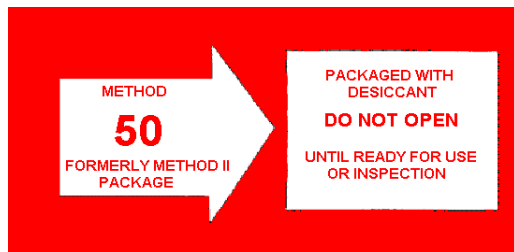
Special Markings

Project Code



Special Handling

Method 50



Electrostatic Discharge (ESD) Sensitive



Unit Pack



Intermediate and Exterior Pack

Special Markings

Expedited Handling



NMCS

NSN 7540-00-139-4835
5084-102

OPTIONAL FORM 84 (REV. 2-84)
PREVIOUS EDITION NOT USABLE

Special Markings

DOT Hazardous Materials

- Proper Shipping Name
- UN Number
- Hazard Labels



Cargo Aircraft Only Label



UN Performance Specification

Example of a Single or Combination Marking:
a b c d e f g h



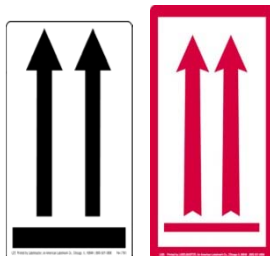
4G / Y 7.4 / S / 99 / USA / DOD

- (a) The United Nations Symbol
- (b) Type of Packaging Code
- (c) Packing Group:

X = PG I, II and III
Y = PG II and III
Z = PG III Only

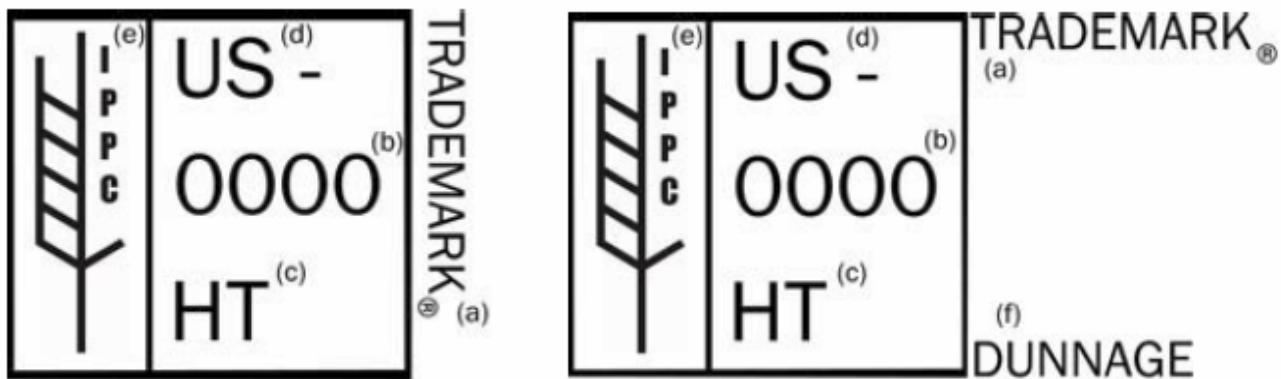
- (d) Maximum Gross Mass (In Kilograms)
- (e) Letter "S", Solid or Inner Packagings
- (f) Year of Manufacture or assembly
- (g) State (Country) authorizing mark
- (h) Symbol of Manufacturer/Certifier

Package Orientation Marking



HEAT TREATED Wood Packaging Material

Required for all Wood Packaging Material (WPM). WPM is defined as wood pallets, skids, load boards, pallet collars, wooden boxes, reels, dunnage, crates, frames, and cleats.



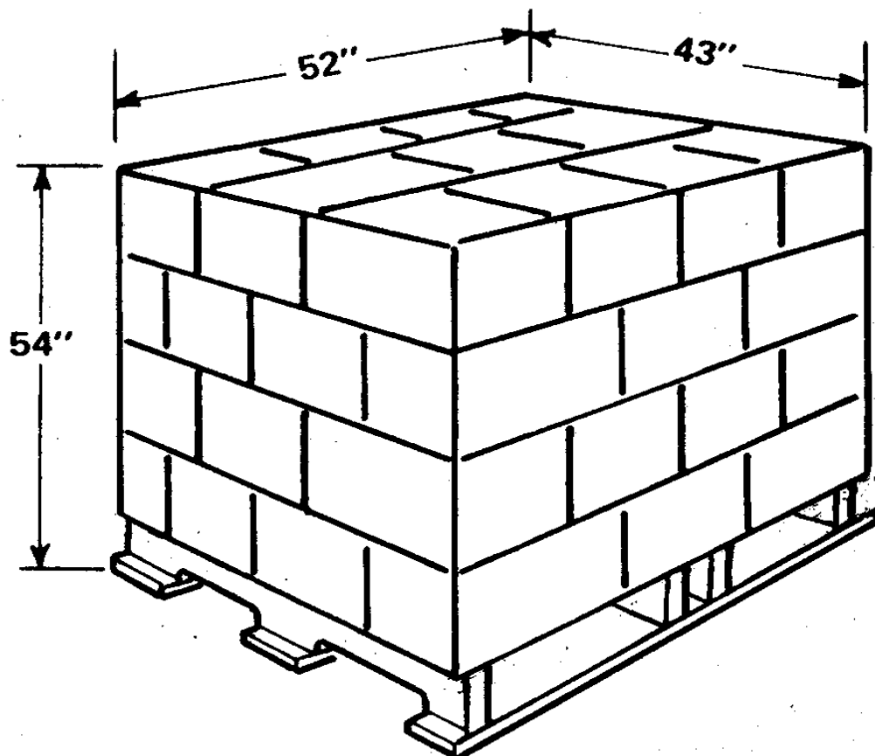
- (a) **Trademark** - Symbol, logo or name of the accredited agency
- (b) **Facility** - product manufacturer name, brand or assigned mill number
- (c) **Heat Treated Mark** - (HT or DH-when dielectric heating is used)
- (d) **Country Code** - The two letter ISO country abbreviation
- (e) **Approved International Symbol** for compliant wood packaging material.
- (f) Indication for use as dunnage (DUN or DUNNAGE).

MIL-STD-147

Palletization

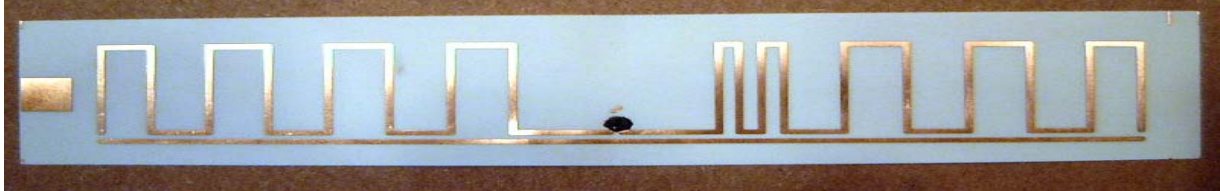
Standard Pallet Loads on a 40" x 48" pallet

- 43 Inches in Length (1.5 inch overhang on each side)
- 52 Inches in Width (2 inch overhang on each side)
- 54 Inches in Height (includes pallet)
- 3000 Lbs. Max Gross Weight
- Provides bonding methods and load patterns



* MIL-STD-147 1E1 (23 DEC 13) - WPM to include dunnage, shall comply and be marked IAW ISPM 15 requirements.

Radio Frequency Identification RFID (Passive)



- DFARS Clause 252.211-7006 (Sep 2011)
- Tags that meet the EPCglobal™ Class 1 Generation 2 standard and are globally unique.
- Applied at case and palletized-unit-load levels
- WAWF used to submit advance shipment notice (ASN) with RFID tag IDs
- Affixed at appropriate locations IAW MIL-STD-129 tag placement specifications

Official Website

<http://www.acq.osd.mil/log/sci/ait.html>

Contains List of “Ship to” Locations and
Supplier Guide

Useful Websites

RFID

<http://www.acq.osd.mil/loq/sci/ait.html>

Packaging Code Look-up

https://camphill.leidos.com/code_lookup.nsf/codecheck

Defense and Federal Specifications

<http://quicksearch.dla.mil/>

DLA Land and Maritime Packaging

<http://www.landandmaritime.dla.mil/offices/packaging/pkgsitemap.asp>

American Lumber Standard Committee (WPM)

http://www.alsc.org/WPM_summary_mod.htm

Key Specifications

MIL-STD-2073-1E	Standard Practice for Military Packaging
MIL-STD-2073-1D	Standard Practice for Military Packaging
MIL-STD-129	Military Marking for Shipments and Storage
MIL-STD-147	Palletized Unit Loads
MIL-DTL-117	Bags, Heat-Sealable
MIL-DTL-6060	Bags, Watervaporproof, Heat-Sealable, Complex
MIL-STD-3010	Test Procedures for Packaging Materials
ASTM D3951	Standard Practice for Commercial Packaging
ASTM D1974	Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes
ASTM D5168	Standard Practice for Fabrication and Closure of Triple Wall Corrugated Fiberboard Containers

* Refer to contract/solicitation for appropriate revision (and change number) of specification