



DLA
DEFENSE LOGISTICS AGENCY



The Nation's Combat Support Logistics Agency

Packaging Overview

Packaging Specialist
2022



WARFIGHTER ALWAYS



Agenda

- **DLA Packaging Overview**
- **Packaging Requirements (MIL-STD-2073)**
 - **Packaging Codes Decoded**
 - **Preservation Methods**
 - **Quantity Unit Pack (QUP)**
 - **Intermediate Container Quantity (ICQ)**
- **Military Marking (MIL-STD-129)**
- **Wood Packaging Material (WPM)**
- **Electrostatic Discharge (ESD)**
- **Hazardous Materials**
- **Lead Free Requirements (E-code)**
- **Commercial Packaging (ASTM D3951)**
- **Reports of Discrepancies**
- **Resources**



DLA Packaging Overview

Defense Logistics Agency Packaging Program

Focus

- Defines DLA Field Activity responsibilities concerning the packaging of DLA managed materiel, to be procured, stored, and shipped with adequate, continuous protection at the lowest overall cost.

Results

- Materiel is procured, fully packaged in a **ready-for-issue** state
- Products must arrive at ultimate consignee's (user) destination in **serviceable condition**.

Innovation

- Contractors are encouraged to use **state-of-the-art materials**, processes, and equipment in accordance with contract requirements.



PACKAGING

Preservation, Packaging, Packing, and Marking



MIL-STD-129R

- Military Marking for Shipment and Storage
- Department of Defense uniformed marking requirements
- Mandatory marking requirements for ALL DoD shipments to identify material and trace back to the contractor
- Free document to download
- **NOTE:** Review pictorial marking requirements within ASTM D5445 when special markings required.



MIL-STD-2073-1E

- Standard Practice for Military Packaging
- Decodes preservation, packaging, packing, and special marking requirements
- Appendix J denotes packaging data
- Required for long-term storage and/or items with specific protection needs that cannot be met with commercial practices
- Free document to download
- **NOTE:** If packaging data is missing, review paragraph 4.2 and notify contracting officer



ASTM D3951

- Standard Practice for Commercial Packaging
- Establishes minimum requirements for packaging of supplies and equipment
- Package design must facilitate multiple handling, shipment by any mode, and storage for minimum of one year in enclosed facility without damage to the product.
- Unit package must also be ready for issue and redistribution without any additional packaging and/or marking.
- Copyright protected – must purchase this document
- **NOTE:** Only applicable when an acquisition document references this document solely.



MIL-STD-2073-1E

Why?

Development of codes are determined by item characteristics (e.g. *physical, chemical, fragility factor, destination considerations, etc.*)

Coded packaging data is for items going into the Military Distribution Cycle – required to protect parts for world-wide shipment, long-term storage, and/or against severe environmental conditions (e.g. extreme climate, terrain, operational, and transportation environments)

Information contained on solicitations and awards specifying the packaging coded data required to protect item throughout the life cycle (*Section B, on solicitations and awards*)



Example of MIL-STD-2073-1E Packaging Requirements

MIL-STD-2073 Packaging Codes



001 = Quantity Unit Pack (QUP)

41 = Method of Preservation (MOP)

1 = Cleaning/Drying (5.2.1 in 2073, J.4.4)

00 = Preservative Material

00 = Wrapping Material

NA = Cushioning/Dunnage Material

A = Cushioning/Dunnage Thickness

BS = Unit Container

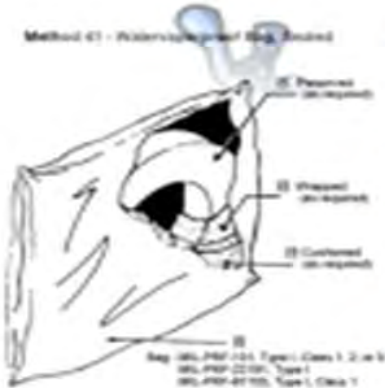
M = Optional Indicator Code (OPI)

Q = Pack Code

E5 = Intermediate Container (IC)

012 = Intermediate Container Quantity (ICQ)

32 = Special Marking Code – Type I Shelf-life





QUP and Unit of Issue - How it Appears on Contracts

Unit of Issue is in the Contract, Section B

Pay close attention to UI and QUP lines on contract. Unit of Issue marked as: 1 PR

| <u>CLIN</u> | <u>PR</u> | <u>PRLI</u> | <u>UI</u> | <u>Quantity</u> | <u>Unit Price</u> | <u>Total Price</u> |
|-------------|------------|-------------|-----------|-----------------|-------------------|--------------------|
| 1 | 0040888212 | 0001 | PR | 15 | \$113.05 | \$1695.75 |

QUP & Packaging Data is in the Contract, Section B under PREP FOR DELIVERY

PKG DATA – MIL-STD-2073-1E, DATED 23 May 2008

QUP= 001; PRES MTHD = 41; CLNG/DRY = 1; PRES MAT = 00; WRAP MAT = 00;
 CUSH/DUNN MAT = NA; CUSH/DUNN THCK = A; UNIT CONT = BS; OPI = M;
 INTERMDTE CONT = E5; INTERMDTE CONT QTY = 012; PACK CODE = Q

MARKING SHALL BE IN ACCORDANCE WITH MIL-STD-129.

SPECIAL MARKING CODE: 32 (TYPE 1 SHELF LIFE)

PALLETIZATION SHALL BE IN ACCORDANCE WITH RP001: DLA Packaging Requirements for Procurement



Basic Methods of Preservation for MIL-STD-2073-1E

- **Method 10** Physical & Mechanical Protection only
- **Method 20** Preservative Coating Requirement
- **Method 30** Waterproof and/or Greaseproof Protection
- **Method 40** Watervapor proof protection
- **Method 50** Watervapor proof protection with Desiccant

Attention: As numeric value increases, so does level of preservation increase.



Specialized Preservation Methods

“GX”

- Denotes part is Electrostatic Sensitive Device (ESD) or Electromagnetic Interference (EMI)
- Requires ESD Control Program
- Requires item shall be handled at ESD Workstation
- Shall only use “**Approved**” ESD packaging materials by “**Qualified**” sources
- Requires ESD labeling for users to be aware of special handling requirements
- Failure to comply with “GX” requirements can either **damage** part or cause **latent failures**
- Compromised parts (parts exposed to ESD) shall be returned to the vendor

“HM”

- Denotes regulated by transportation as a Hazardous Material
- Packaging and marking in accordance with Hazardous Materials regulations
- Performance-Oriented Packaging (POP) certified containers
- Packers shall be certified to package and mark hazardous material per Title 49 Code of Federal Regulations (CFR)



Quantity Unit Pack and Intermediate Container Quantity (ICQ)

Factors for Determining Military Packaging Quantity Unit Pack (QUP)

QUP of one:

- Repairable items, items valued \$50 or more
- Items packed in accordance with Method of Preservation 50, irregular shaped, delicate or fragile items
- Items with a unit of issue of pair (PR), set (SE), or kit (KT) (see paragraph B.3.1 – B.3.6)

QUP more than one:

- Formulas based upon item weight, dimensions, cost, and method of preservation (see paragraphs B.3.8 – B.3.8.2 and Table B.4.1 or B.4.2)

Determining Quantities per Intermediate Container Quantity (ICQ)

ICQ Maximums:

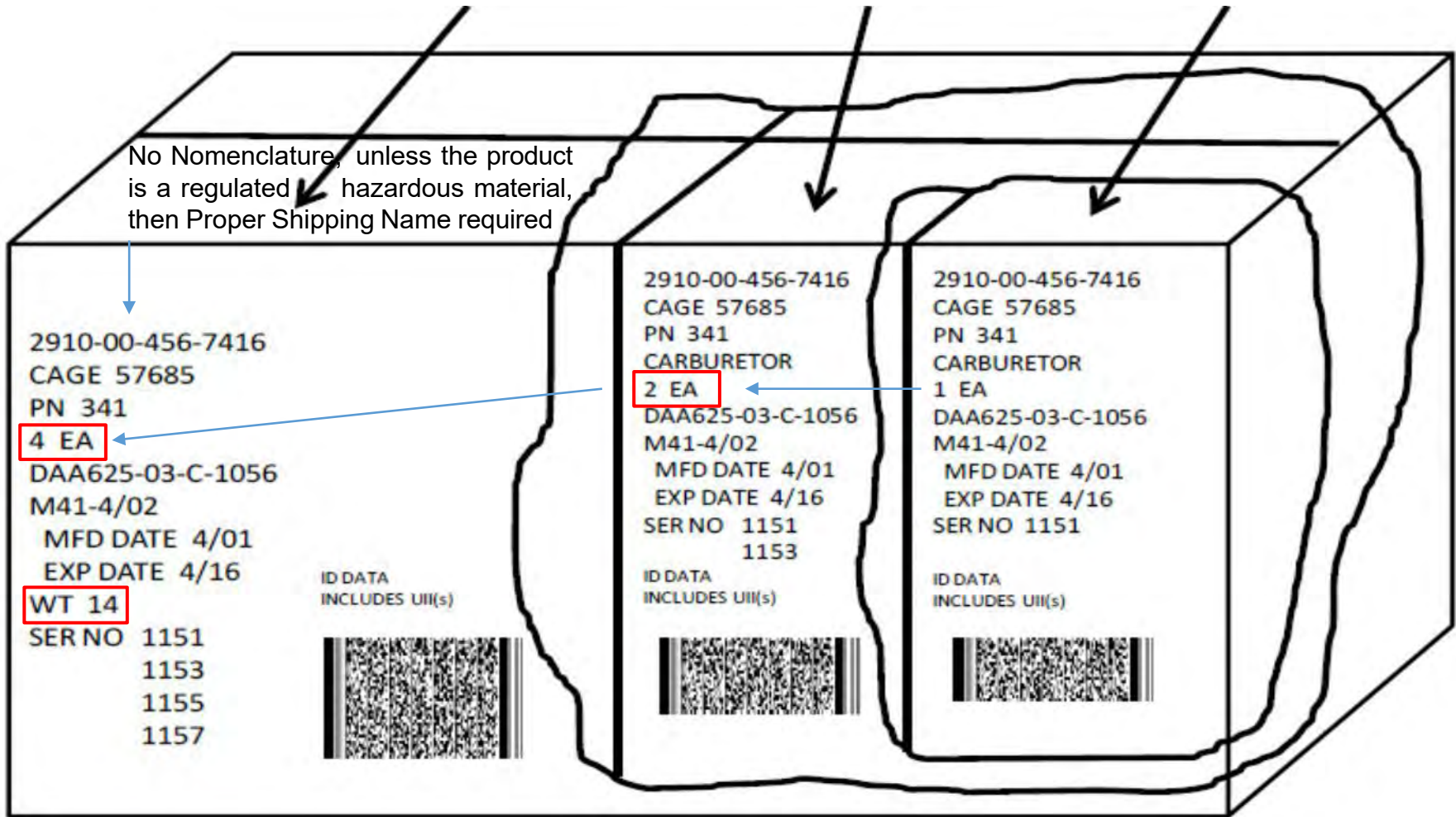
- 100 unit packs per intermediate container
- 40 pounds
- 1.5 cubic feet with at least two dimensions not exceeding 16 inches

Intermediate Container Limitations

- When quantity shipped to a single destination is **less than the established ICQ**, then place all unit packs in a *minimum size shipping container*
- When the contract/order total quantity is **more than established ICQ** pack as many intermediate containers to the established ICQ and the *remaining quantity in smallest container to accommodate these unit packs*



MIL-STD-129 Marking Examples

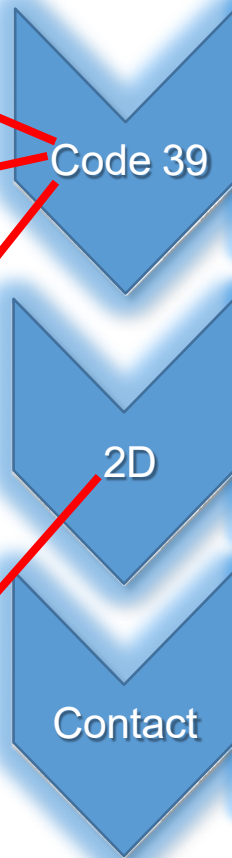




Military Shipping Label (MSL)

The recommended MSL size is 4 by 6 inches

| | | | |
|---|--|--|----------------------|
| TCN SW81238350D001XXX | | | |
| From SW8123 In-the-clear Address 3 Lines Max, 35 Characters Per Line XXXXXXXXXX1XXXXXXXXXX2XXXXXX3XXXXXX | | TAC / Type Service / Postage SZZZ PILTL | |
| Piece 1 Of 1 | Weight (lb.) 7760 | Date Shipped 1090 | RDD 999 |
| | Cube (ft.) 385 | Project 9BU | Priority 1 |
| Ship To / PDE DOV | In-the-clear Address 5 Lines Max, 35 Characters Per Line Abcdefg Hijklmno Pqrstuv Wxyz Abcdefg Hijklmno Pqrstuv Wxyz XXXXXXXXXX1XXXXXXXXXX2XXXXXXXXXX3XXXXXX | | |
| POD RMS | MSL, Supply, & TCMD Data | | |
| FMS Case CKM | | | |
| W55XGJ | | Ultimate Consignee / Mark For Consignee Ultimate / Mark For Consignee Address 5 Lines Max, 35 Characters Per Line Abcdefg Hijklmno Pqrstuv Wxyz Abcdefg Hijklmno Pqrstuv Wxyz XXXXXXXXXX1XXXXXXXXXX2XXXXXXXXXX3XXXXXX | |
| | | | |



- Code 39 (Linear)
 - TCN (Transportation Control Number)
 - Piece number
 - Ultimate consignee

- Department of Defense Activity Address Code (DODAAC) PDF417 (2D)
- Shipment
- Line item
- Transportation Control Movement Document (TCMD) date

- **Transportation Office:**
 - 1-800-456-5567
 - delivery@dla.mil



NOTE: Vendor Shipment Module (VSM) has feature to print MSL.



ASTM D3951

Allows for selected items to be packaged in accordance with ASTM D3951, Standard Practice for Commercial Packaging

- **Commercial Packaging QUP:**
 - ASTM D3951, paragraph 5.1.2.2 governs Unit Package Quantity
 - Contract QUP takes precedence over ASTM D3951
 - Typically, QUP 001 unless otherwise specified within your contract
- **Commercial Packaging ICQ:**
 - ASTM D3951, paragraph 5.1.3 governs intermediate package quantity
- **Commercial Packaging “Marking”:**
 - ASTM D3951. paragraph 5.1.6.5 governs markings for DoD shipments (in accordance with MIL-STD-129)
 - Mark Method of Pack for commercial packaging as “**MCP**”
 - Bar code in accordance with AIM BC1
- **Wood Packaging Material (WPM)**
 - ASTM D3951, paragraph 5.1.6.4 governs compliance with ISPM Publication No. 15



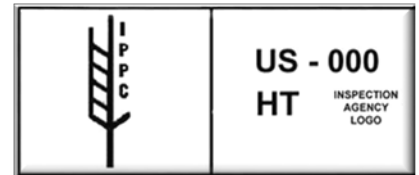
Wood Packaging Material (WPM)

- **Why ISPM for WPM?**

- To help reduce the risk of pest infestation, a global set of measures has been accepted and are applied to WPM.
- Ensure WPM is in conformance with the International Standards of Phytosanitary Measures Publication No. 15 (ISPM 15).

- **Requirement:**

- Heat-treated wood requirements in accordance with DLA contract clause 52.247-9012 Requirements for Treatment of Wood Packaging Material (WPM) (9/2016)
- Applies to wood packaging material used to fabricate crates, boxes, and pallets
- WPM is also cited in DLA Master List of Technical Quality Requirements: RP001
- **ALL WPM shall be heat-treated, including pallets, and marked accordingly with the heat-treated compliant mark, ISPM 15**
- **Mark must be visible on exterior of container or pallet for inspection**
- **Level A Packing:** Pallets shall utilize ANSI/MHIA-MH1, Part No. MH 1/9-05SW4048 distributed.
- **Level B Packing:** Pallets shall utilize ANSI/MHIA-MH1, Part No. MH 1/9-02SW4048 pallet for unit loads less than 1500 lbs. evenly distributed. For unit loads greater than 1500 lbs., but less than 3000 lbs. evenly distributed, ANSI/MHIA-MH1, Part No. MH1/9-05SW4048 pallet shall be utilized.



NOTE: Failure to comply may result in frustrated cargo and delayed payments. Contractor shall be responsible to pay for expenses to remedy non-compliant WPM. **UN countries** strictly enforce this requirement.



Electrostatic Discharge (ESD)

Method of Preservation Code = GX

- **Cushioning: Four Choices –**
 - A-A-3129, Type I, Grade B; or
 - PPP-C-795, Class 2; or
 - A-A-59135, Class 1, Grade B; or
 - PPP-C-1797, Type II
- **Wrap:** use MIL-PRF-81705, Type III
NOTE: Type II is no longer used
- **Unit Container (Barrier):** MIL-DTL-117, Type I, Class F, Style 1 (MIL-PRF-81705, Type I, Class 1)

NOTE: Some packaging codes require both bag and box to make a unit package. Both containers must have the same markings.

Approved Sources of MIL-PRF-81705

Qualified Products List (QPL)

- **Type I:** Cadillac Products Packaging Co. (CADPAK ESD)/EDCO or Covalence Specialty
Marked: **EMI/STATIC SHIELD**
- **Type III:** Caltex Plastics (CP STAT 100M) is the only MIL-PRF-81705, Type III qualified manufacturer. Marked: **STATIC SHIELD**
- **Beware of non-approved material** (see MIL-PRF-81705 for all require barrier markings)
- Check ASSIST Quick Search for QPLs at:
<http://quicksearch.dla.mil>





Electrostatic Discharge (ESD) Cont.

Supplemental Packaging Instructions

- **39 - ESD Sensitive Device**
requirements of MIL-STD-129 apply



ATTENTION:
Required label
for unit packs



ATTENTION:
Required label
for exterior and
intermediate
containers

- This item requires DoD **Qualified Electrostatic Discharge (ESD) protective packaging materials** in accordance with **MIL-PRF-81705**. The supplier shall be responsible for verifying that all MIL-PRF-81705 barrier materials (or converted bags) are supplied from a **qualified manufacturer currently listed on QPL-81705**.
- For additional ESD packaging information, refer to the following DLA packaging web site:

<https://www.dla.mil/HQ/LogisticsOperations/Packaging/PackFAQs/ESDS/>



HAZARDOUS MATERIALS

- Title 49 Code of Federal Regulations (CFR) for Land
- IMO/IMDG for Water
- ICAO/ IATA for Commercial Air
- AFMAN 24-204_IP* for Military Air
- Must be marked and labeled IAW latest MIL-STD-129 in addition to required hazardous material markings





Lead-Free (E-code) Marking Requirements

- Legislations drove electronics industry toward the use of lead-free (*Pb-free*) solders and components with Pb-free level termination finishes and materials.
- **Unit Package Marking Requirement for Component Lead Finish, Applies.**
 - Reference: **IPC/JEDEC J-STD-609**, *Marking and Labeling of Components, PCBs and PCBAs to Identify Lead (Pb), Pb-Free and Other Attributes*
 - Adopted by DoD on January 9, 2008
- **Federal Supply Classes (FSCs): 5905, 5910, 5945, 5961, and 5962.** Required to identify the type of Pb-free and Pb-containing solders and finishes to components, assemblies/boards, interconnect terminal finishes and materials.

Marking/Labeling Categories

Pb-containing

e0 – contains Pb2

Pb-free

e1 tin-silver-copper

e2 tin (Sn)

e3 tin (Sn)

e4 precious metal

e5 tin-zinc

e6 contains bismuth

e7 low temperature solder

e8 tin-silver-copper

These are examples of the e-codes and not the full descriptions. The document must be purchased through JDEC for complete definition of the codes to properly mark containers.



Report of Discrepancies

Common Types of Non-Compliances:

- **Heat-treated wood requirements – all wood products used**
 - Not in accordance with MD00100452 Revision C – Requirements for Treatment of Wood Packaging Material (WPM) 9/2016)
 - WPM (including pallets) is not heat treated and marked in accordance with the heat-treated compliant mark, ISPM 15
- **ESD parts not packaged in compliance with Method of Preservation “GX”**
 - Not packaged in DoD approved packaging materials by qualified manufacturers
 - Missing wrapping or cushioning material (one or the other must be inside the barrier bag)
 - Part punctured through barrier bag
 - Tape, staples, or rubber bands inside barrier bag
 - Barrier bag not sealed
- **Marking problems (*most documented errors*)**
 - Elements of MIL-STD-129 omitted
 - Incorrectly labeled
 - Not bar-coded
 - Omission of e-code, shelf-life, or lot date code when cited in the contract
- **Preservation and Packing non-conformances**
 - No authorization to substitute ASTM D3951 for military method of preservation (MOP)
 - Used Incorrect Method of Preservation (e.g. MOP 31 when MOP 41 called out in contract)
 - Container oversized, stacking strength not adequate, damaged shipments



Resources

- **Thomas Register:** List of “Packaging Houses”
(DLA legally cannot endorse any specific “packaging house”)
<http://www.thomasnet.com/prodsearch.html?cov=NA&which=prod&what=Military+Packaging+houses&navsec=search>
- **ASSIST**
ASSIST is the official source for specifications and standards used by the Department of Defense
<http://quicksearch.dla.mil>
- **American Lumber Standard Committee (ALSC)**
Wood Packaging Material (WPM) – Accredited Agencies
http://www.alsc.org/WPM_summary_mod.htm
- **Joint Electron Device Engineering Council (JEDEC)**
The technical voice of the semiconductor industry
<http://www.jedec.org>
- **National Institute of Packaging, Handling & Logistics Engineers (NIPHLE)**
<https://niphle.com>
- **Video of the Importance of Packaging, Preservation, Labeling and Marking**
<http://www.youtube.com/watch?v=mlwl9GkjO9Q&sns=em>

