

# UNITIZATION PROCEDURES FOR 105MM CHEMICAL CARTRIDGES, PACKED 2 PER WOODEN BOX, UNITIZED 20 BOXES PER 35" X 45-1/2" 4-WAY ENTRY PALLET

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## U.S. ARMY MATERIEL COMMAND DRAWING

<p>APPROVED, U.S. ARMY JOINT MUNITIONS COMMAND <i>NLH</i></p> <p><i>David A. Peterson</i> AMSTA-AR-WEP-RP</p>	<p><b>CAUTION: VERIFY PRIOR TO USE AT WWW.DAC.ARMY.MIL THAT THIS IS THE MOST CURRENT VERSION OF THIS DOCUMENT. THIS IS PAGE 1 OF 4.</b></p>		
<p>APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND</p> <p><i>J P White</i></p> <p>U.S. ARMY DEFENSE AMMUNITION CENTER</p>	<p><b>DO NOT SCALE</b></p>		<p><b>MAY 1982</b></p>
	<p>ENGINEER OR TECHNICIAN</p>	<p>BASIC REV.</p>	<p><b>WILLIAM R. FRERICHS</b> <b>PATRICK E. MILLICAN</b></p>
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	<p>TESTED</p>		<p>CLASS    DIVISION    DRAWING    FILE</p>
	<p>19</p>	<p>48</p>	<p>4531</p>

PALLET UNIT DATA				
ITEMS INCLUDED		HAZARD CLASS AND DIVISION	COMPATIBILITY GROUP	APPROX WEIGHT LBS
NSN	DODIC			
1315-00-023-8985	C441	1. 2. 1	K	2, 473
00-028-4796	C441	1. 2. 1	K	2, 473
00-926-3952	C441	1. 2. 1	K	2, 473
01-082-1234	C441	1. 2. 1	K	2, 473

● HAZARD CLASSIFICATION DATA CONTAINED IN THE ABOVE CHART IS FOR GUIDANCE AND INFORMATIONAL PURPOSES ONLY. VERIFICATION OF THE SPECIFIED DATA SHOULD BE MADE BY CONSULTING THE MOST RECENT JOINT HAZARD CLASSIFICATION SYSTEM LISTING OR OTHER APPROVED LISTING(S).

### REVISION

REVISION NO. 1, DATED AUGUST 2003, CONSISTS OF:

1. DELETING ITEM BY NATIONAL STOCK NUMBER FROM THE "PALLET UNIT DATA" CHART
2. ADDING PAGES 3 AND 4 (UPDATING DRAWING FORMAT).

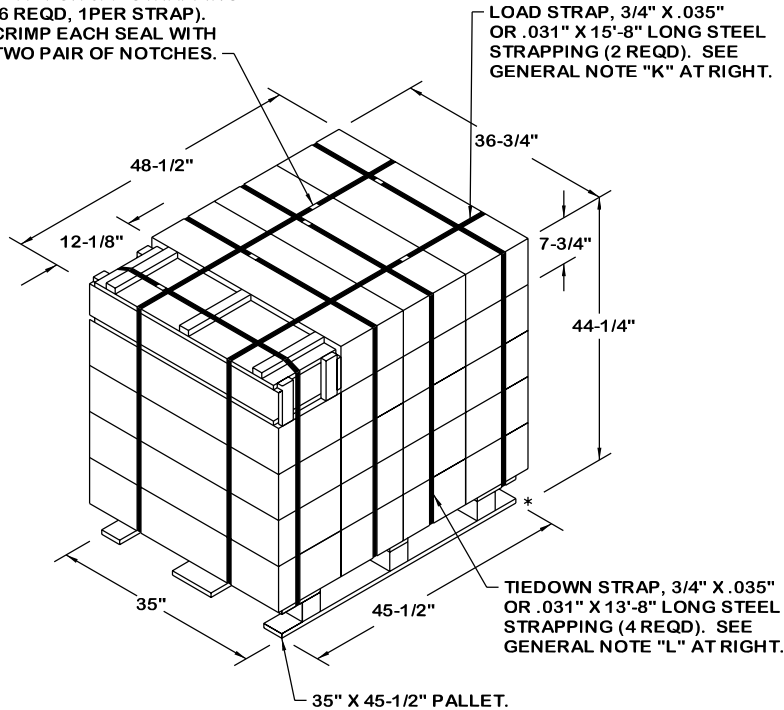
### MATERIAL SPECIFICATIONS

- PALLET - - - - - :: MIL SPEC MIL-P-15011; 4-WAY-ENTRY, STYLE 1A, TYPE I, CLASS 1, PRESERVATIVE AND HEAT TREATED. SEE GENERAL NOTE "P" ON PAGE 3.
- LUMBER - - - - - :: SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOLUNTARY PRODUCT STANDARD PS 20.
- NAILS - - - - - :: ASTM F1667; COMMON STEEL NAIL (NLCMS OR NLCMS). ALT: UNDERLAYMENT NAIL (NLUL), PALLET NAIL (NLPL), OR COOLER NAIL (NLCL) OF SAME SIZE.
- STRAPPING, STEEL - - :: ASTM D3953; FLAT STRAPPING, TYPE 1, HEAVY DUTY, FINISH B (GRADE 2), SIZE 3/4" X .035" OR .031", NOTE: BRITTE OR SLIT EDGES SHALL HAVE FINISH A OVERLAY.
- SEAL, STRAP - - - - :: ASTM D3953; CLASS H, FINISH A, B (GRADE 2), OR C, DOUBLE NOTCH TYPE, STYLE I, II, OR IV.

**GENERAL NOTES**

SEAL FOR 3/4" STRAPPING  
(6 REQD, 1PER STRAP).  
CRIMP EACH SEAL WITH  
TWO PAIR OF NOTCHES.

LOAD STRAP, 3/4" X .035"  
OR .031" X 15'-8" LONG STEEL  
STRAPPING (2 REQD). SEE  
GENERAL NOTE "K" AT RIGHT.



**PALLET UNIT**

SEE GENERAL NOTE "B" AT RIGHT.

20 BOXES OF 105MM CTGS (2 PER BOX) @ 120 LBS	- -	2,400 LBS (APPROX)
DUNNAGE	- - - - -	8 LBS
PALLET	- - - - -	65 LBS

TOTAL WEIGHT	- - - - -	2,473 LBS (APPROX)
CUBE	- - - - -	45.6 CU FT (APPROX)

**BILL OF MATERIAL**

PALLET, 35" X 45-1/2"	- - - -	1 REQD	- - - -	65 LBS	
STEEL STRAPPING, 3/4"	-	86.00'	REQD	- - - -	7.68 LBS
SEAL FOR 3/4" STRAPPING	- - - -	6 REQD	- - - -	NIL	

**(GENERAL NOTES CONTINUED)**

- N. ALL FILLER ASSEMBLIES WILL BE POSITIONED IN THE TOP LAYER OR LAYERS OF THE CENTER STACK OR STACKS OF A UNIT LOAD.
- O. THE MAXIMUM QUANTITY OF BOXES THAT MAY BE ELIMINATED FROM ANY ONE PALLET IS 18. IF THE REDUCED QUANTITY OF 18 BOXES IS INSUFFICIENT TO SATISFY REDUCED LOAD REQUIREMENTS, TWO PALLETS MUST BE UTILIZED TO OBTAIN THE CORRECT QUANTITY OF OMITTED BOXES.
- P. ALL NON-MANUFACTURED WOOD USED IN THE PALLETIZED LOAD SHALL BE HEAT TREATED TO A CORE TEMPERATURE OF 56 DEGREES CELSIUS FOR A MINIMUM OF 30 MINUTES. THE PALLET MANUFACTURER AND THE MANUFACTURER OF WOOD TO BUILD DUNNAGE ASSEMBLIES FOR THE PALLETIZED LOAD SHALL BE AFFILIATED WITH AN INSPECTION AGENCY ACCREDITED BY THE U.S. DEPARTMENT OF AGRICULTURE. THE PALLET MANUFACTURER AND THE MANUFACTURER OF WOOD TO BUILD DUNNAGE ASSEMBLIES FOR THE PALLETIZED LOAD SHALL ENSURE TRACEABILITY TO THE ORIGINAL SOURCE OF HEAT TREATMENT. EACH PALLET OR DUNNAGE ASSEMBLY SHALL BE MARKED TO SHOW THE CONFORMANCE TO THE INTERNATIONAL PLANT PROTECTION CONVENTION STANDARD. PALLETS AND DUNNAGE ASSEMBLIES MADE OF NON-MANUFACTURED WOOD SHALL BE HEAT TREATED AND MARKED APPROPRIATELY. THE QUALITY MARK FOR THE PALLET SHALL BE PLACED ON TWO OPPOSITE END POSTS ON THE SAME SIDE AS THE PRESERVATIVE MARKING. THE QUALITY MARK FOR THE DUNNAGE ASSEMBLIES SHALL BE PLACED ON TWO OPPOSITE SIDES. FOREIGN MANUFACTURERS SHALL HAVE THE HEAT TREATMENT OF NON-MANUFACTURED WOOD PRODUCTS VERIFIED IN ACCORDANCE WITH THEIR NATIONAL PLANT PROTECTION ORGANIZATION'S COMPLIANCE PROGRAM.

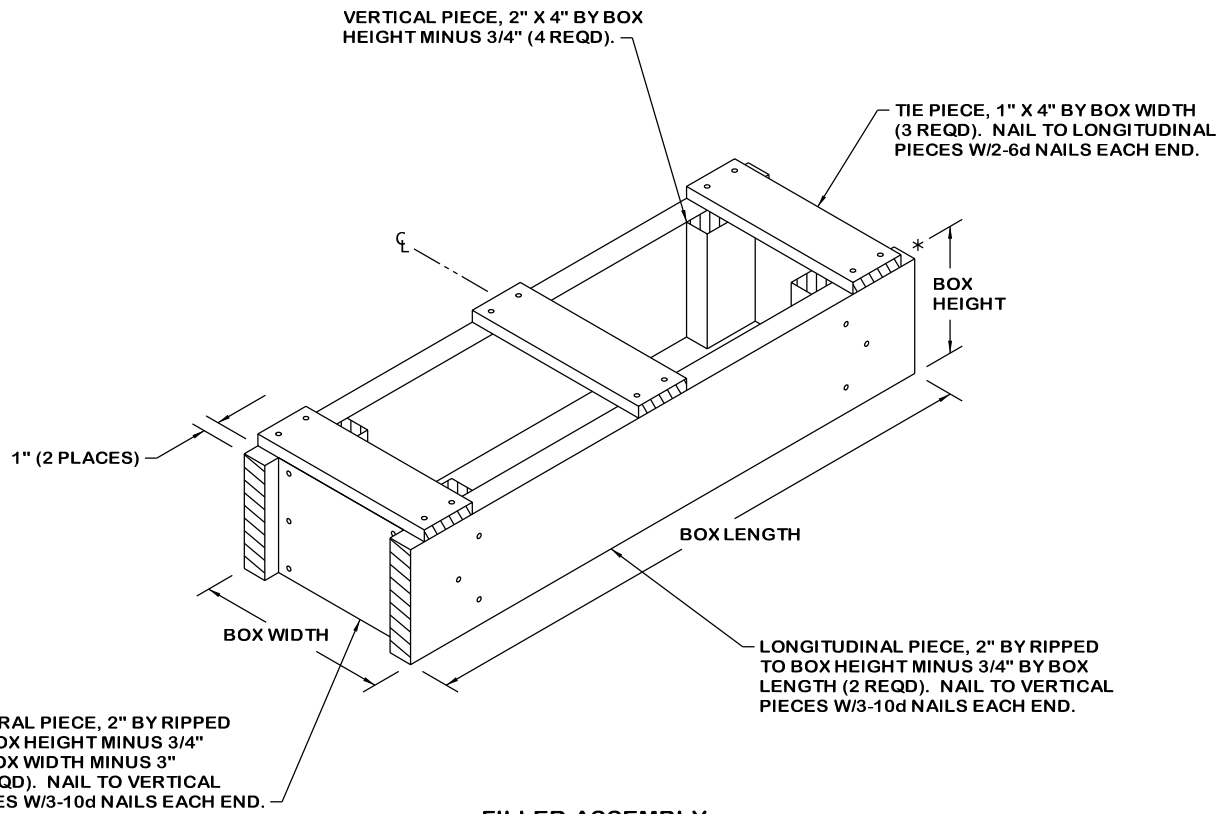
- A. THIS DOCUMENT HAS BEEN PREPARED IN ACCORDANCE WITH AR 740-1, AND AUGMENTS TM 743-200-1 (CHAPTER 5) AND CONFORMS TO MIL-STD-1660.
- B. DIMENSIONS, CUBE AND WEIGHT OF A PALLET UNIT WILL VARY SLIGHTLY DEPENDING UPON THE ACTUAL DIMENSIONS OF THE BOXES AND THE WEIGHT OF THE SPECIFIC ITEM BEING UNITIZED.
- C. DIMENSIONAL LUMBER SPECIFIED THROUGHOUT THIS DOCUMENT IS OF A NOMINAL SIZE, UNLESS OTHERWISE SPECIFIED. FOR EXAMPLE, 1" X 4" MATERIAL IS ACTUALLY 3/4" THICK BY 3-1/2" WIDE.
- D. A PLUS OR MINUS 1/4" IS ALLOWED ON OVERALL DIMENSIONS OF ANY DUNNAGE ASSEMBLY. HOWEVER, SIMILAR PIECES IN AN ASSEMBLY MUST BE WITHIN 1/8" OF THE SAME DIMENSION.
- E. WHEN ASSEMBLING A PALLET UNIT, CARE SHOULD BE TAKEN TO ENSURE THAT THE BOXES ARE EVENLY ALIGNED HORIZONTALLY AND VERTICALLY SO THAT THE SIDES AND ENDS OF THE PALLET UNIT DO NOT EXCEED A 1/2" TOLERANCE.
- F. THE STYLE 1A PALLET DELINEATED IN THE DETAIL AT LEFT NEED NOT HAVE CHAMFERS OR STRAP SLOTS AS SPECIFIED WITHIN MILITARY SPECIFICATION MIL-P-15011 WHEN USED FOR THE UNITIZATION OF ITEMS COVERED BY THIS DOCUMENT.
- G. THE FOLLOWING AMC DRAWINGS ARE APPLICABLE FOR OUTLOADING AND STORAGE OF THE ITEMS COVERED BY THIS DOCUMENT.

CARLOADING	- - - -	19-48-4115-5PA1002
TRUCKLOADING	- - - -	19-48-4117-11PA1003
STORAGE	- - - -	19-48-4118-1-2-3-4-14-22PA1002

END OPENING ISO CONTAINER	- - - -	19-48-4153-15PA1002
MIL VAN	- - - -	19-48-4166-15PA1003
SIDE OPENING ISO CONTAINER	- - - -	19-48-4267-15PA1009

- H. IN ORDER TO OBTAIN COMPACT (SOUND) UNITS, ALL STRAPS SHALL BE LOCATED IN PROPER ALIGNMENT AND TENSIONED UNTIL THEY CUT INTO THE EDGE OF THE BOXES AND THE PALLET DECK. AFTER TENSIONING, ALL STRAPS WILL BE SECURED USING ONE SEAL CRIMPED WITH TWO PAIR OF NOTCHES PER SEAL. ALL STRAPPING MUST BE STRAIGHT WITHIN 2" ON ANY SURFACE OF THE UNITIZED LOAD; I.E. TOP, BOTTOM, SIDES, OR ENDS THAT IS ENCOMPASSES.
- J. WHEN APPLYING ANY STRAP, CARE MUST BE EXERCISED TO ENSURE THAT THE END OF THE STRAP ON THE UNDERSIDE OF THE JOINT EXTENDS AT LEAST 6" BEYOND THE SEAL. THIS EXTRA MINIMUM LENGTH OF STRAP IS REQUIRED TO PERMIT SUBSEQUENT RETENSIONING OF THE STRAPS AS NEEDED. RETENSIONING CAN BE ACCOMPLISHED WITHOUT REPLACING STRAPPING OR SPLICING STRAPPING THROUGH THE USE OF A TENSIONING TOOL, AS MANUFACTURED BY SEVERAL COMPANIES, AND THE APPLICATION OF ONE ADDITIONAL SEAL.
- K. THE LOAD STRAPS MUST BE PRE-POSITIONED ON THE PALLET DECK PRIOR TO PLACING BOXES ON THE PALLET. LOAD STRAPS MUST BE TENSIONED AND SEALED PRIOR TO APPLICATION OF TIEDOWN STRAPS.
- L. INSTALL EACH TIEDOWN STRAP TO PASS UNDER THE DECK/STRINGER BOARDS OF THE PALLET AND TO BE LOCATED AS SHOWN. TIEDOWN STRAPS WILL NOT BE APPLIED UNTIL THE LOAD STRAPS HAVE BEEN TENSIONED AND SEALED.
- M. IF LESS THAN 20 BOXES ARE TO BE LOADED ON A PALLET, IT MAY BE ACCOMPLISHED BY SUBSTITUTING FILLER ASSEMBLIES, AS DETAILED ON PAGE 4, FOR THE OMITTED BOXES. IF FOUR BOXES ARE TO BE OMITTED, A COMPLETE LAYER OF BOXES WILL BE OMITTED. IF MORE THAN FOUR BOXES ARE TO BE OMITTED, A COMBINATION OF FILLER ASSEMBLIES AND OMITTED LAYERS CAN BE USED TO SATISFY THE QUANTITY OF BOXES TO BE UNITIZED.

(CONTINUED AT LEFT)



**FILLER ASSEMBLY**  
(FOR MINUS ONE BOX)