

# APPENDIX 28U

## UNITIZATION PROCEDURES FOR BOXED AMMUNITION AND COMPO- NENTS ON 4-WAY ENTRY PALLETS

**CARTRIDGE, 60MM, HE M720A2, OR HE M768A1,  
OR ILLUMINATING M721, OR IR ILLUMINATING  
M767, PACKED 8 PER PA191 METAL CONTAINER,  
UNITIZED 56 CONTAINERS PER 40" X 48" PALLET;  
APPROX CONTAINER SIZE 12-5/16" L X 6- 5/16" W X  
18-13/16" H**

**NOTICE: THIS APPENDIX CANNOT STAND ALONE BUT MUST BE USED IN CONJUNCTION WITH THE BASIC UNITIZATION  
PROCEDURES DRAWING 19-48-4116-20PA1002.**

**DISTRIBUTION STATEMENT A:**

**APPROVED FOR PUBLIC RELEASE  
DISTRIBUTION IS UNLIMITED.**

### U.S. ARMY MATERIEL COMMAND DRAWING

<b>APPROVED, U.S. ARMY RESEARCH, DEVELOPMENT AND ENGINEERING COMMAND</b>  REHMSTEDT.MA RK.J.1230548400 <small>Digitally signed by REHMSTEDT.MA.RK.J.1230548400 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=REHMSTEDT.MA.RK.J.1230548400 Date: 2015.03.20 09:11:13 -05'00'</small> <b>RDAR-EIL-TP</b>		<b>CAUTION: VERIFY PRIOR TO USE AT <a href="https://mhp.redstone.army.mil">HTTPS://MHP.REDSTONE.ARMY.MIL</a> THAT THIS IS THE MOST CURRENT VERSION OF THIS DOCUMENT. THIS IS PAGE 1 OF 4.</b>						
<b>APPROVED, U.S. ARMY JOINT MUNITIONS COMMAND</b>  RUS.ALLEN.J .1230354282 <small>Digitally signed by RUS.ALLEN.J.1230354282 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=RUS.ALLEN.J.1230354282 Date: 2015.03.25 08:07:39 -05'00'</small> <b>AMSJM-LIT</b>		<b>DO NOT SCALE</b>		<b>FEBRUARY 2010</b>				
		DESIGN ENGINEER	BASIC REV.	CANH TRAN  CANH TRAN				
<b>APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND</b>  SHIMP.UPTON .R.1231257183 <small>Digitally signed by SHIMP.UPTON.R.1231257183 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=SHIMP.UPTON.R.1231257183 Date: 2015.03.25 09:52:34 -05'00'</small>		ENGINEERING DIVISON	FIEFFER.LAUR A.A.1230375727 <small>Digitally signed by FIEFFER.LAURA.A.1230375727 DN: c=US, o=U.S. Government, ou=PKI, ou=USA, cn=FIEFFER.LAURA.A.1230375727 Date: 2014.11.24 09:14:58 -08'00'</small>		REVISION NO. 1	MAY 2015		
		TEST ENGINEER	FELICIANO.ADI N.1259200373 <small>Digitally signed by FELICIANO.ADI.N.1259200373 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=FELICIANO.ADI.N.1259200373 Date: 2014.12.03 06:19:27 -06'00'</small>		<b>SEE THE REVISION LISTING ON PAGE 2</b>			
		TEST REPORT	09-18		CLASS	DIVISION	DRAWING	FILE
U.S. ARMY DEFENSE AMMUNITION CENTER		EXPLOSIVE SAFETY DIRECTORATE	CAMBRON.KIMBE R.LY.K.1229953512 <small>Digitally signed by CAMBRON.KIMBERLY.K.1229953512 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=CAMBRON.KIMBERLY.K.1229953512 Date: 2014.12.09 07:32:50 -06'00'</small>		19	48	4116/ 28U	20PA1002

PALLET UNIT DATA				
ITEMS INCLUDED		*HAZARD CLASS AND DIVISION	*COMPATIBILITY GROUP	APPROX WEIGHT (LBS)
NSN	DODIC			
1310-				
01-581-4232	B647	1. 2. 2	G	3, 112
01-581-4807	BA04	1. 2. 2	G	3, 112
01-622-4345	BA44	1. 2. 2	E	3, 112
01-622-6414	BA45	1. 2. 2	E	3, 112

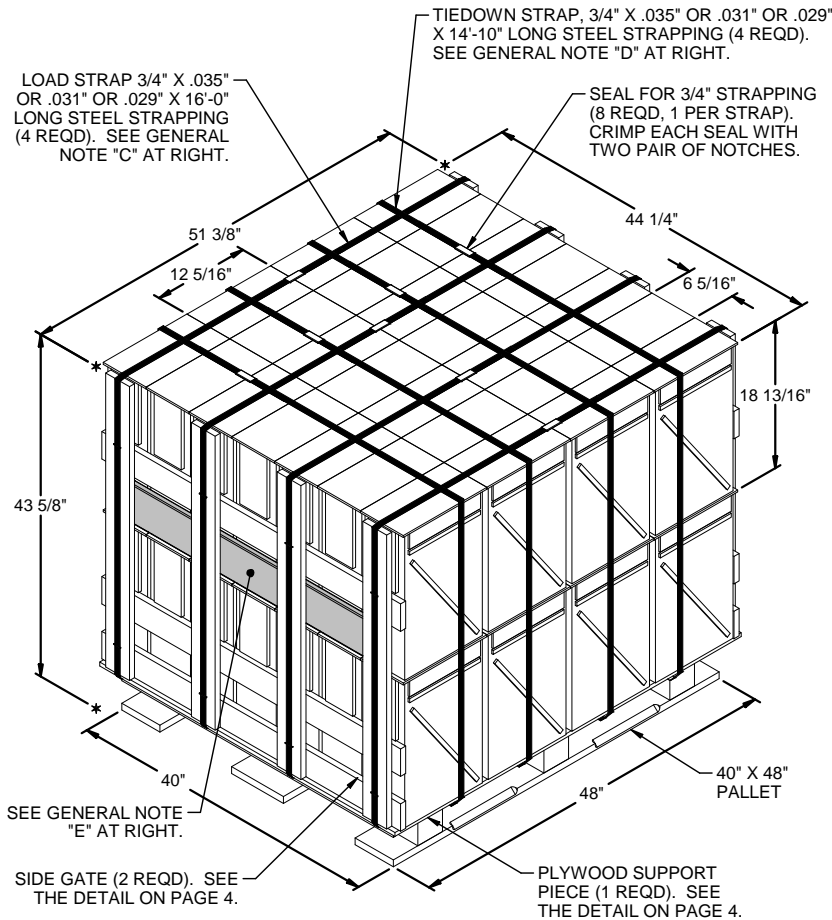
\*HAZARD CLASSIFICATION DATA CONTAINED IN THE ABOVE CHART IS FOR GUIDANCE AND INFORMATIONAL PURPOSES ONLY. VERIFICATION OF THE SPECIFIED DATA SHOULD BE MADE BY CONSULTING THE MOST RECENT JOINT HAZARD CLASSIFICATION SYSTEM LISTING OR OTHER APPROVED LISTING(S).

### REVISION

REVISION NO. 1, DATED MAY 2015, CONSISTS OF:

1. CHANGING THE PA191 DIMENSIONS AND UPDATING DUNNAGE DUE TO THE DIMENSION CHANGE.
2. ADDING NOTE UNDER "SIDE GATE" DETAIL ON PAGE 4.
3. ADDING ITEMS BY NATIONAL STOCK NUMBER TO THE "PALLET UNIT DATA" CHART.
4. UPDATING COVER PAGE TO REFLECT NEW ITEMS.

**GENERAL NOTES**



**PALLET UNIT**

SEE GENERAL NOTE "B" AT RIGHT.

56 CONTAINERS OF 60MM CARTRIDGES (8 PER CONTAINER) @ 53 LBS	--	2,968 LBS
DUNNAGE	-----	64 LBS
PALLET	-----	80 LBS

TOTAL WEIGHT	-----	3,112 LBS (APPROX)
CUBE	-----	57.4 CU FT (APPROX)

**BILL OF MATERIAL**

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	47.00	15.67
NAI LS	NO. REQD	POUNDS
6d (2")	48	0.28
10d (3")	19	0.29
PALLET, 40" X 48" ----- 1 REQD ----- 80 LBS		
PLYWOOD, 1/2" ----- 15.41 SQ FT REQD ----- 21.18 LBS		
STEEL STRAPPING, 3/4" ----- 123.30' REQD ----- 11.00 LBS		
SEAL FOR 3/4" STRAPPING ----- 8 REQD ----- NIL		
STAPLE, 15/16" X 3/4" ----- 16 REQD ----- NIL		

**(GENERAL NOTES CONTINUED)**

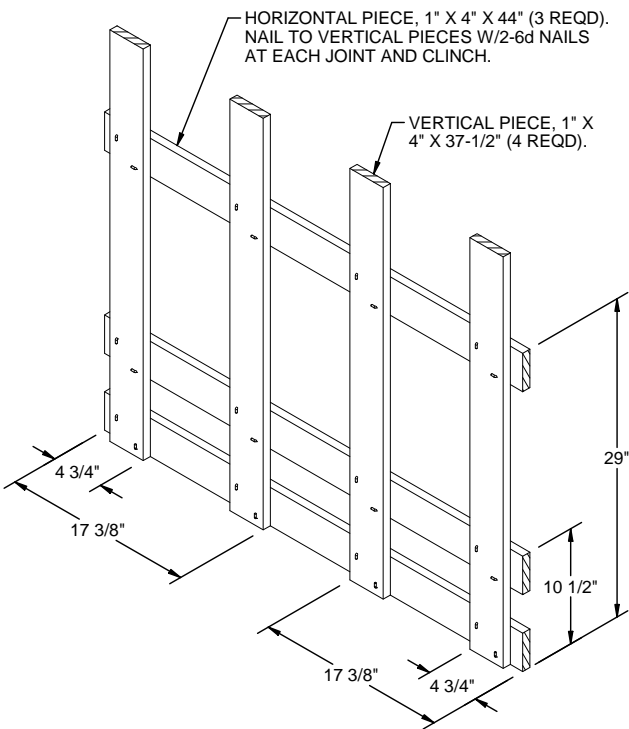
- N. THE 44-1/4" LENGTH DIMENSION IS AN EXCEPTION TO THE BASIC PROCEDURES. HOWEVER, THE EXCEPTION IS NECESSARY FOR THE AMMUNITION PACK COVERED BY THIS APPENDIX TO MOST EFFECTIVELY GET AN ACCEPTABLE, COMPACT AND SOUND PALLET UNIT.
- O. FOR DETAILS OF THE PA191 CONTAINER, SEE ARDEC DRAWING 13027661.

- A. THIS APPENDIX CANNOT STAND ALONE BUT MUST BE USED IN CONJUNCTION WITH THE BASIC UNITIZATION PROCEDURES DRAWING 19-48-4116-20PA1002. TO PRODUCE AN APPROVED UNIT LOAD, ALL PERTINENT PROCEDURES, SPECIFICATIONS AND CRITERIA SET FORTH WITHIN THE BASIC DRAWING WILL APPLY TO THE PROCEDURES DELINEATED IN THIS APPENDIX. ANY EXCEPTIONS TO THE BASIC PROCEDURES ARE SPECIFIED IN THIS APPENDIX.
- B. DIMENSIONS, CUBE AND WEIGHT OF A PALLET UNIT WILL VARY SLIGHTLY DEPENDING UPON THE ACTUAL DIMENSIONS OF THE CONTAINERS AND THE WEIGHT OF THE SPECIFIC ITEM BEING UNITIZED.
- C. THE LOAD STRAPS MUST BE PRE-POSITIONED ON TOP OF THE PALLET DECKBOARDS AND UNDER THE PLYWOOD SUPPORT PIECE PRIOR TO SECURING THE PLYWOOD AND PLACING THE CONTAINERS ON THE PALLET. ALIGN WITH THE VERTICAL PIECES OF THE SIDE GATES AND STAPLE TO THE SIDE GATES WITH TWO STAPLES EACH. THE LOAD STRAPS MUST BE TENSIONED AND SEALED PRIOR TO APPLICATION OF THE TIEDOWN STRAPS.
- D. INSTALL EACH TIEDOWN STRAP TO PASS UNDER THE TOP DECKBOARDS OF THE PALLET AND TO BE LOCATED AS SHOWN. TIEDOWN STRAPS WILL NOT BE APPLIED UNTIL THE LOAD STRAPS HAVE BEEN TENSIONED AND SEALED.
- E. FIVE PLASTIC SHEETS (ARDEC DRAWING # 9317920-5) SHALL BE FOLDED TO FIT BETWEEN THE OUTER SIDE GATE VERTICAL PIECES, THE UPPER HORIZONTAL PIECE, AND THE LOWER PA191 CONTAINER LIDS. INSTALL BETWEEN PA191 CONTAINERS AND SIDE GATE ON ONE END OF PALLET UNIT. SECURE WITH WATER PROOF TAPE AT LEAST 1" WIDE PRIOR TO TENSIONING LOAD STRAPS.
- F. THE FOLLOWING AMC DRAWINGS ARE APPLICABLE FOR UNLOADING AND STORAGE OF THE ITEMS COVERED BY THIS APPENDIX.
 

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
MILVAN	----	19-48-4166-15PA1003
SIDE OPENING ISO	----	
CONTAINER	----	19-48-4267-15PA1009

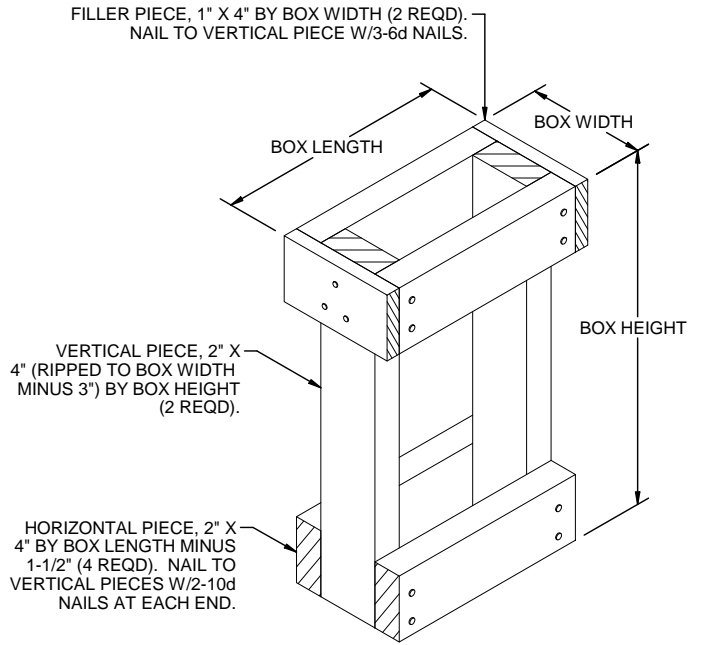
- G. IF ITEMS COVERED HEREIN ARE UNITIZED PRIOR TO ISSUANCE OF THIS REVISION TO THIS APPENDIX, THE BOXES NEED NOT BE REUNITIZED SOLELY TO CONFORM TO THIS REVISION.
- H. THE UNITIZATION PROCEDURES DEPICTED HEREIN MAY ALSO BE USED FOR UNITIZING 60MM CARTRIDGES PACKED IN PA191 METAL CONTAINERS WHEN IDENTIFIED BY DIFFERENT NATIONAL STOCK NUMBERS (NSN) THAN WHAT IS SHOWN ON PAGE 2, PROVIDED THE CONTAINER PACK DOES NOT VARY FROM WHAT IS DELINEATED HEREIN. THE EXPLOSIVE CLASSIFICATION OF OTHER ITEMS MAY BE DIFFERENT THAN WHAT IS SHOWN.
- J. THE STYLE 1 PALLET DELINEATED IN THE DETAIL AT LEFT NEED NOT HAVE CHAMFERS OR STRAP SLOTS AS SPECIFIED WITHIN MILITARY SPECIFICATION MIL-DTL-15011 WHEN USED FOR THE UNITIZATION OF ITEMS COVERED BY THIS APPENDIX.
- K. ALL DUNNAGE SHALL BE PRESERVATIVE TREATED IN ACCORDANCE WITH GENERAL NOTE "AA" IN THE BASIC PROCEDURES, AND HEAT TREATED IN ACCORDANCE WITH GENERAL NOTE "J" IN THE BASIC PROCEDURES.
- L. EMPTY OR REJECT PA191 CONTAINERS MAY BE USED AS FILLER CONTAINERS AS NECESSARY. FILLER CONTAINERS MUST BE INSTALLED IN THE MIDDLE OF THE TOP LAYER(S) OF CONTAINERS. WHEN (EMPTY) FILLER CONTAINERS ARE USED IN PLACE OF OMITTED CONTAINERS TO COMPLETELY FILL OUT A LAYER ON A PALLET, THEY WILL BE MARKED AS SPECIFIED IN ARDEC DRAWING 12982865.
- M. IF DEEMED MORE ECONOMICALLY FEASIBLE THE "ALTERNATE PLYWOOD SUPPORT PIECE", WITH ROUTED STRAP SLOTS, MAY BE SUBSTITUTED FOR THE PLYWOOD SUPPORT PIECE DEPICTED ABOVE. WHEN USING THE "ALTERNATE PLYWOOD SUPPORT PIECE", THE LOAD STRAPS MUST BE THREADED THROUGH THE ROUTED STRAP SLOTS. THE LOAD STRAPS WILL NOT BE PRE-POSITIONED ON THE PALLET DECK AS REQUIRED IN GENERAL NOTE "C". SEE THE "ALTERNATE PLYWOOD SUPPORT PIECE" DETAILS ON PAGE 4.

(CONTINUED AT LEFT)

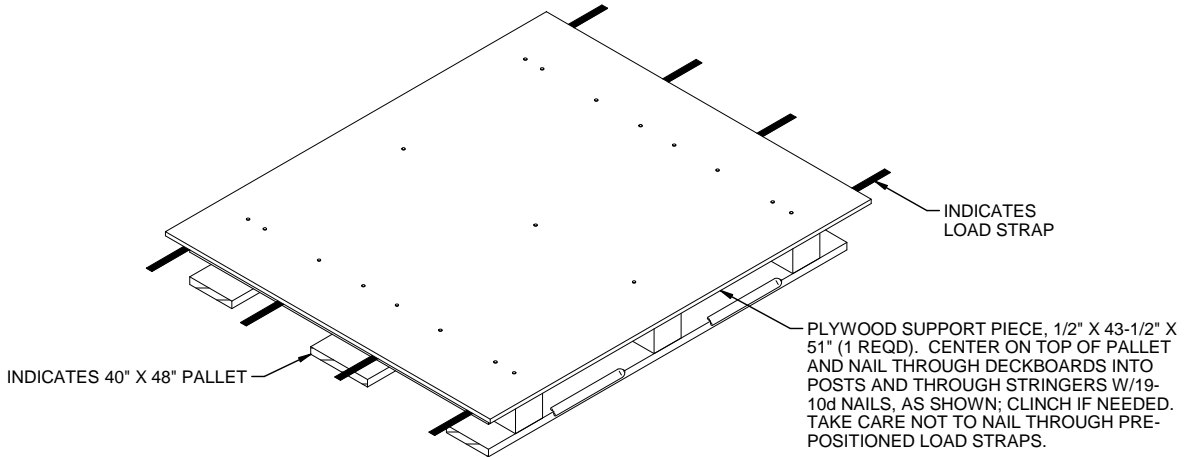


**SIDE GATE**  
(2 REQD)

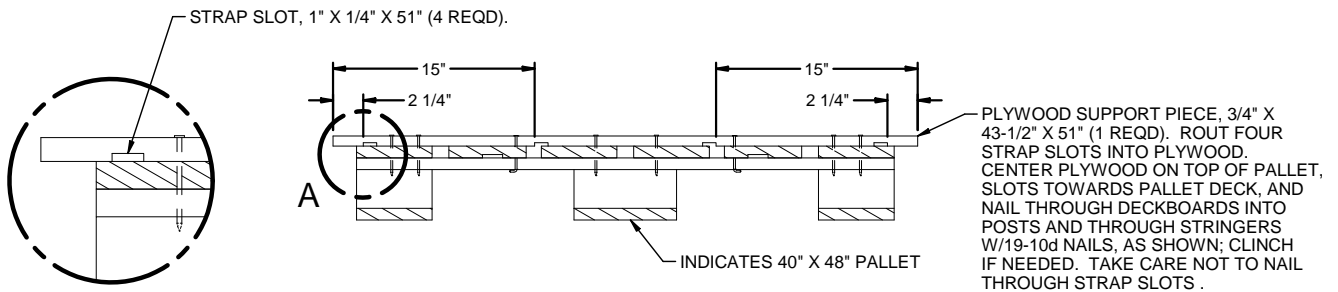
**NOTE:** FOR A ONE HIGH LOAD, ELIMINATE THE UPPER HORIZONTAL PIECE AND SHORTEN THE VERTICAL PIECES TO 18-1/2".



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



**PLYWOOD SUPPORT PIECE PLACEMENT**



**ALTERNATE PLYWOOD SUPPORT PIECE**

SEE GENERAL NOTE "M" ON PAGE 3.