

# APPENDIX 18

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

**CARTRIDGE, 30MM, PACKED VARIOUS QUANTITIES,  
LINKED OR UNLINKED, PER M592 METAL BOX, UNIT-  
IZED 24 BOXES PER 42" X 53" PALLET; APPROX  
BOX SIZE 18-5/8" L X 9-1/2" W X 14-5/8" H**

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

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### U.S. ARMY MATERIEL COMMAND DRAWING

<p><b>APPROVED, U.S. ARMY RESEARCH, DEVELOPMENT AND ENGINEERING COMMAND</b></p> <p>REHMSTEDT.MA RK.J.1230548400</p> <p style="font-size: small;">Digitally signed by REHMSTEDT.MARK.J.1230548400 DN: c=US, ou=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=REHMSTEDT.MARK.J.1230548400 Date: 2016.12.08 09:40:03 -06'00'</p> <p style="text-align: right;">RDAR-EIL-TP</p>	<p><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></p>		<p><b>NOVEMBER 1981</b></p>																										
<p><b>APPROVED, U.S. ARMY JOINT MUNITIONS COMMAND</b></p> <p>RUS.ALLEN.J .1230354282</p> <p style="font-size: small;">Digitally signed by RUS.ALLEN.J.1230354282 DN: c=US, ou=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=RUS.ALLEN.J.1230354282 Date: 2016.12.15 12:26:20 -06'00'</p> <p style="text-align: right;">AMSJM-LIT</p>	<p><b>DO NOT SCALE</b></p>	<p><b>REVISION NO. 7</b></p> <p><b>NOVEMBER 2016</b></p>																											
<p><b>APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND</b></p> <p>SHIMP.UPTON .R.1231257183</p> <p style="font-size: small;">Digitally signed by SHIMP.UPTON.R.1231257183 DN: c=US, ou=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=SHIMP.UPTON.R.1231257183 Date: 2016.12.16 13:04:39 -06'00'</p> <p style="text-align: center;">U.S. ARMY DEFENSE AMMUNITION CENTER</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">DESIGN ENGINEER</td> <td style="width: 10%;">BASIC</td> <td style="width: 70%;">WILLIAM R. FRERICHS</td> </tr> <tr> <td></td> <td>REV.</td> <td>QUYEN TRAN</td> </tr> </table>	DESIGN ENGINEER	BASIC	WILLIAM R. FRERICHS		REV.	QUYEN TRAN	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">ENGINEERING DIVISON</td> <td style="width: 75%;">FIEFFER.LAUR A.A.1230375727</td> </tr> <tr> <td>TEST ENGINEER</td> <td>FELICIANO.AD IN.1259200373</td> </tr> <tr> <td>TEST REPORT</td> <td>NA</td> </tr> <tr> <td>EXPLOSIVE SAFETY DIRECTORATE</td> <td>TIRONE.JOSEPH.A NDREW.102668374 9</td> </tr> </table>	ENGINEERING DIVISON	FIEFFER.LAUR A.A.1230375727	TEST ENGINEER	FELICIANO.AD IN.1259200373	TEST REPORT	NA	EXPLOSIVE SAFETY DIRECTORATE	TIRONE.JOSEPH.A NDREW.102668374 9	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="4" style="text-align: center;"><b>SEE THE REVISION LISTING ON PAGE 2</b></td> </tr> <tr> <td style="width: 15%;">CLASS</td> <td style="width: 15%;">DIVISION</td> <td style="width: 15%;">DRAWING</td> <td style="width: 55%;">FILE</td> </tr> <tr> <td style="text-align: center;"><b>19</b></td> <td style="text-align: center;"><b>48</b></td> <td style="text-align: center;"><b>4116/18</b></td> <td style="text-align: center;"><b>20PA1002</b></td> </tr> </table>	<b>SEE THE REVISION LISTING ON PAGE 2</b>				CLASS	DIVISION	DRAWING	FILE	<b>19</b>	<b>48</b>	<b>4116/18</b>	<b>20PA1002</b>
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PALLET UNIT DATA				
ITEMS INCLUDED		*HAZARD CLASS AND DIVISION	*COMPATIBILITY GROUP	APPROX WEIGHT (LBS)
NSN	DODIC			
1305-				
01-278-1137	B020	1.4	C	3,426
01-278-1138	B020	1.4	C	3,138
01-279-6177	B021	1.4	C	2,634
01-278-1139	B022	1.4	C	2,634
01-278-1142	B023	1.2.2	E	2,634
01-278-1140	B024	1.2.2	E	2,466
01-278-6881	B025	1.2.2	C	4,000
01-278-1144	B026	1.2.2	C	4,338**
01-278-1143	B027	1.2.2	C	4,338**
01-079-5386	B118	1.4	C	3,210
01-080-9416	B118	1.4	C	3,210
01-268-7274	B118	1.4	C	3,066
01-644-8390	B118	1.4	C	3,066
01-077-2932	B119	1.4	C	3,210
01-078-5505	B120	1.4	C	3,210
01-081-3340	B123	1.2.2	E	2,346
01-081-1636	B124	1.2.2	E	2,346
01-081-3341	B125	1.2.2	E	3,210
01-268-9373	B129	1.2.2	E	3,066
01-644-8397	B129	1.2.2	E	3,066
01-155-3197	B130	1.2.2	E	2,346
01-152-0421	B131	1.2.2	E	2,346
01-158-4539	B133	I NERT		3,306
01-268-7273	B133	I NERT		3,066
01-168-0538	B135	1.4	C	3,882
01-266-9572	B137	1.4	C	3,210
01-266-9571	B138	1.4	C	2,466
01-266-9570	B139	1.4	C	2,466
01-266-9569	B140	1.2.2	E	3,210
01-268-7275	B140	1.2.2	E	3,066
01-266-9568	B141	1.2.2	E	2,466
01-266-9567	B142	1.2.2	E	2,466
01-276-6605	B143	1.2.2	E	3,210
01-276-6606	B143	1.2.2	E	3,138
01-276-6607	B144	1.2.2	E	2,466
01-276-6608	B145	1.2.2	E	2,634
01-276-6609	B146	1.4	C	3,428
01-276-6610	B146	1.4	C	3,138
01-277-8018	B147	1.4	C	2,466
01-276-6611	B148	1.4	C	2,634
01-276-6612	B149	1.2.2	E	3,426
01-278-1141	B149	1.2.2	E	3,138

**REVISIONS**

- REVISION NO. 1, DATED FEBRUARY 1982, CONSISTS OF:
- ADDING ITEM BY NATIONAL STOCK NUMBER TO THE "PALLET UNIT DATA" CHART.
- REVISION NO. 2, DATED OCTOBER 1983, CONSISTS OF:
- ADDING ITEMS BY NATIONAL STOCK NUMBER TO THE "PALLET UNIT DATA" CHART.
- REVISION NO. 3, DATED JULY 1984, CONSISTS OF:
- ADDING ITEMS BY NATIONAL STOCK NUMBER TO THE "PALLET UNIT DATA" CHART.
- REVISION NO. 4, DATED JULY 1988, CONSISTS OF:
- ADDING ITEMS BY NATIONAL STOCK NUMBER TO THE "PALLET UNIT DATA" CHART.
- REVISION NO. 5, DATED MAY 1989, CONSISTS OF:
- ADDING ITEMS BY NATIONAL STOCK NUMBER (NSN) TO "PALLET UNIT DATA" CHART.
- REVISION NO. 6, DATED SEPTEMBER 1993, CONSISTS OF:
1. DELETING HORIZONTAL STRAP.
  2. ADDING LOAD STRAPS.
  3. MODIFYING SUPPORT GATES.
  4. UPDATING "PALLET UNIT DATA" CHART.
- REVISION NO. 7, DATED NOVEMBER 2016, CONSISTS OF CHANGES PER ECP R14S2046 INCLUDING:
1. ADDING ITEMS BY NATIONAL STOCK NUMBER (NSN) TO "PALLET UNIT DATA" CHART.
  2. ADDING .029" THICKNESS STRAPPING TO THE LEADERS (3) ON PAGE 3.
  3. REMOVING STRAP CUTTER NOTE (GENERAL NOTE "G").
  4. UPDATING GENERAL NOTE "K" FROM MIL-P-15011 TO MIL-DTL-15011.
  5. UPDATING DRAWING TO CURRENT STANDARD FORMAT.

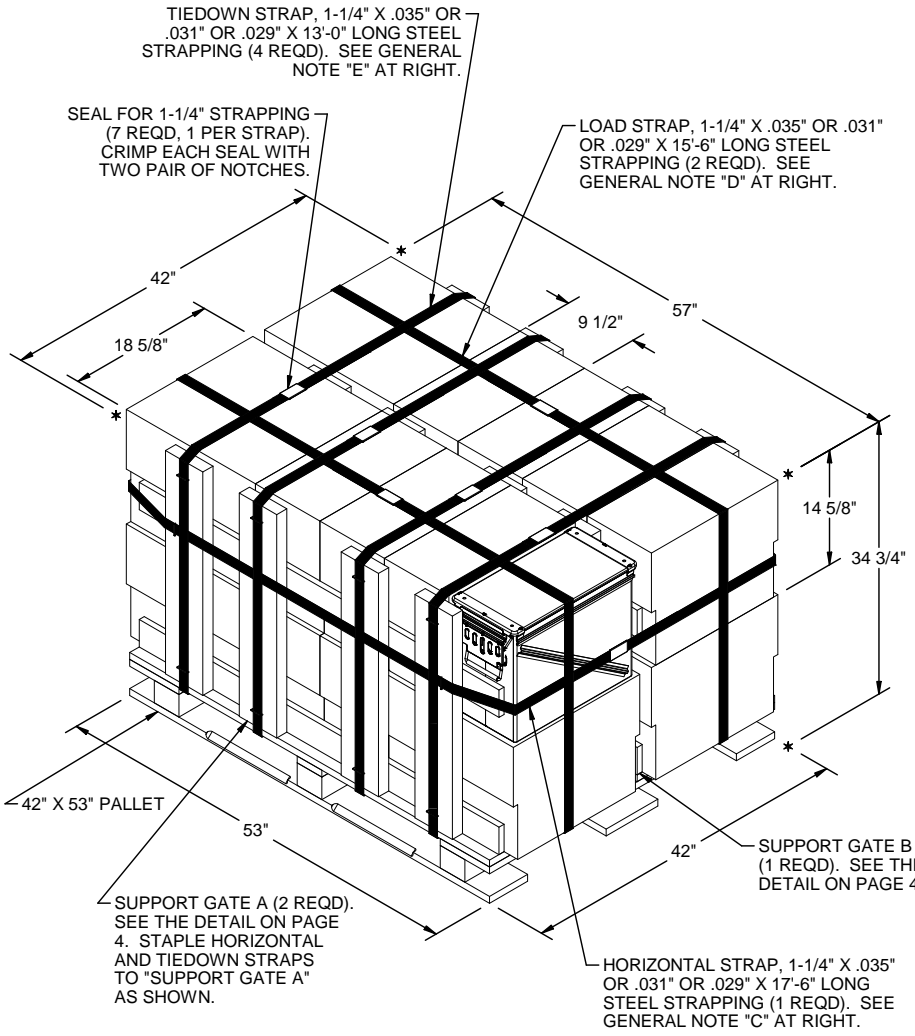
\*HAZARD CLASSIFICATION DATA CONTAINED IN THE CHART AT RIGHT IS FOR GUIDANCE AND INFORMATIONAL PURPOSES ONLY. VERIFICATION OF THE SPECIFIED DATA SHOULD BE MADE BY CONSULTING THE MOST RECENT JOINT HAZARD CLASSIFICATION SYSTEM LISTING OR OTHER APPROVED LISTING(S).

\*\*THE 4,338 LBS WEIGHT 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.

**GENERAL NOTES**

- 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 BOXES AND THE WEIGHT OF THE SPECIFIC ITEM BEING UNITIZED.
- C. INSTALL THE HORIZONTAL STRAP TO ENCIRCLE A LAYER OF BOXES ON THE PALLET AND TO BE ALIGNED WITH THE HORIZONTAL PIECE OF THE "SUPPORT GATES" AS SHOWN. THE HORIZONTAL STRAP MUST BE TENSIONED AND SEALED PRIOR TO THE APPLICATION OF LOAD AND TIEDOWN STRAPS.
- D. THE LOAD STRAPS MAY BE THREADED THROUGH THE STRAP SLOTS OF A PALLET OR PRE-POSITIONED ON THE PALLET DECK PRIOR TO PLACING THE BOXES ON THE PALLET. LOAD STRAPS MUST BE TENSIONED AND SEALED AFTER THE APPLICATION OF THE HORIZONTAL STRAP.
- E. INSTALL EACH TIEDOWN STRAP TO PASS UNDER THE TOP DECK BOARDS OF THE PALLET AND TO BE ALIGNED WITH THE VERTICAL PIECES OF THE "SUPPORT GATES" AS SHOWN. TIEDOWN STRAPS WILL NOT BE APPLIED UNTIL THE HORIZONTAL AND LOAD STRAPS HAVE BEEN TENSIONED AND SEALED.
- F. THE FOLLOWING AMC DRAWINGS ARE APPLICABLE FOR OUTLOADING 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 30MM CARTRIDGES WHEN IDENTIFIED BY DIFFERENT NATIONAL STOCK NUMBERS (NSN) THAN WHAT IS SHOWN ON PAGE 2, PROVIDED THE BOX PACK DOES NOT VARY FROM WHAT IS DELINEATED HEREIN. THE EXPLOSIVE CLASSIFICATION OF OTHER ITEMS MAY BE DIFFERENT THAN WHAT IS SHOWN.
- J. IF THE TOTAL WEIGHT OF A 24-BOX UNIT LOAD EXCEEDS 4,000 POUNDS, A SUFFICIENT NUMBER OF BOXES MUST BE REPLACED WITH "FILLER ASSEMBLIES", AS DEPICTED ON PAGE 4, SO THAT THE TOTAL UNIT WEIGHT IS EQUAL TO OR SLIGHTLY LESS THAN THE 4,000 POUNDS MAXIMUM ALLOWABLE UNIT WEIGHT.
- K. THE STYLE 1B 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.
- L. ALL DUNNAGE SHALL BE PRESERVATIVE TREADED IN ACCORDANCE WITH GENERAL NOTE "AA" IN THE BASIC PROCEDURES.
- M. DIMENSIONS GIVEN FOR DUNNAGE PIECES WILL BE FIELD CHECKED PRIOR TO THEIR ASSEMBLY TO THE PALLET UNIT. CANS MUST FIT SNUGLY IN THE DUNNAGE ASSEMBLIES. ALSO, DUE TO THE VARIATION OF CAN DIMENSIONS, ADJUSTMENTS MAY BE REQUIRED AS TO THE LOCATION OF CERTAIN PIECES OF DUNNAGE IN A DUNNAGE ASSEMBLY.
- N. FOR DETAILS OF THE M592 METAL BOX SEE ARDEC DRAWING 10542565.

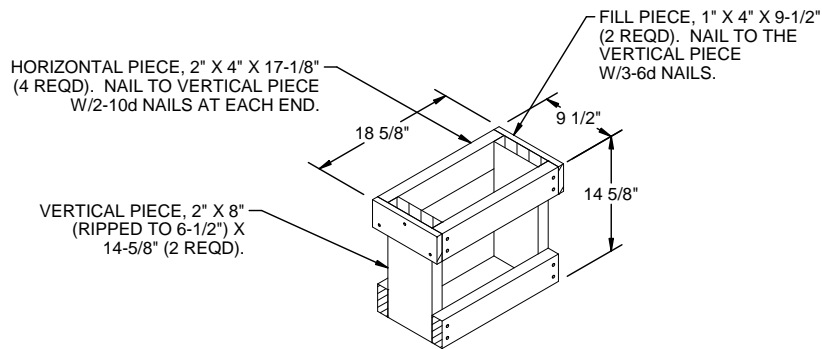


**PALLET UNIT**

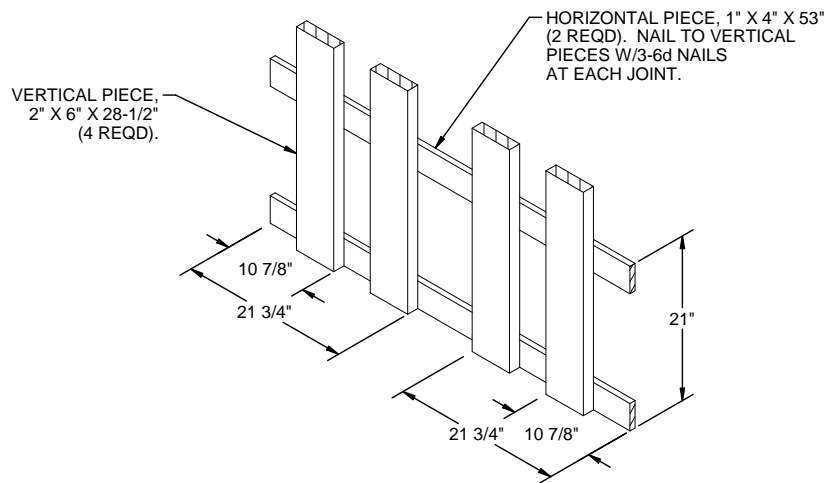
SEE GENERAL NOTE "B" AT RIGHT.

24 BOXES OF 30MM CARTRIDGES @ 159 LBS	- - - - -	3,816 LBS
DUNNAGE	- - - - -	96 LBS
PALLET	- - - - -	90 LBS
<b>TOTAL WEIGHT</b>		<b>4,002 LBS (APPROX)</b>
<b>CUBE</b>		<b>48.1 CU FT (APPROX)</b>

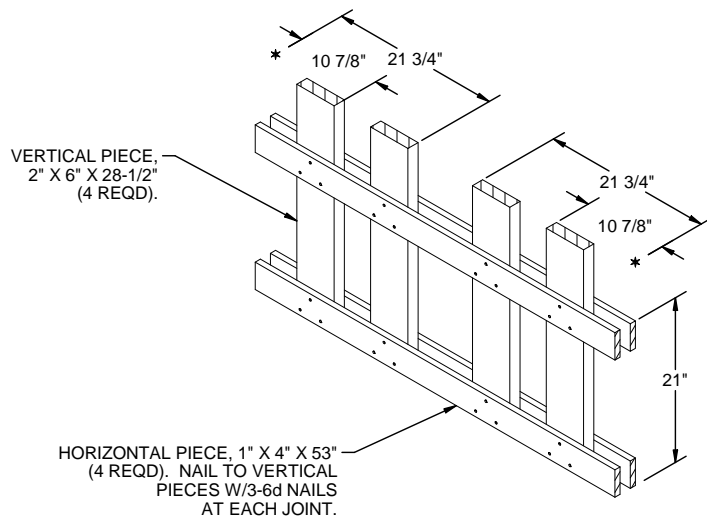
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	35.33	11.78
2" X 6"	28.50	28.50
NAI LS	NO. REQD	POUNDS
6d (2")	96	0.57
PALLET, 42" X 53"	1 REQD	90 LBS
STEEL STRAPPING, 1-1/4"	100.50' REQD	14.36 LBS
SEAL FOR 1-1/4" STRAPPING	7 REQD	NIL
STAPLE	20 REQD	NIL



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



**SUPPORT GATE A**  
(2 REQD)



**SUPPORT GATE B**  
(1 REQD)