

# APPENDIX 55

## UNITIZATION PROCEDURES FOR AMMUNITION AND COMPONENTS PACKED IN CYLINDRICAL METAL CONTAINERS ON 4-WAY ENTRY METAL OR RESIN-TREATED PAL- LETS

**PROJECTILE, 155MM, M982 OR M982A1, EXCALI-  
BUR, PACKED 1 PER PA179 CONTAINER, UNITIZED 9  
CONTAINERS PER 44-1/2" X 33-9/16" SPECIAL SIZE  
METAL PALLET; APPROX CONTAINER SIZE 44-1/2" L  
X 9-1/4" W X 9-1/4" 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

<small>APPROVED, COMBAT CAPABILITIES DEVELOPMENT COMMAND ARMAMENTS CENTER</small>  <b>HANSSEN.JOSEP H.W.1376495538</b>  <small>Digitally signed by HANSSEN.JOSEPH.W.13764955 38 Date: 2023.09.21 14:37:55 -05'00'</small>  <small>FCDD-ACE-LTP</small>		<b>CAUTION: VERIFY PRIOR TO USE AT <a href="https://www.dau.edu/cop/ammo/Pages/Default.aspx">https://www.dau.edu/cop/ammo/Pages/Default.aspx</a> THAT THIS IS THE MOST CURRENT VERSION OF THIS DOCUMENT. THIS IS PAGE 1 OF 4.</b>			
<small>APPROVED, U.S. ARMY JOINT MUNITIONS COMMAND</small>  <b>WARD.GINA. M.1369379808</b>  <small>Digitally signed by WARD.GINA.M.1369379808 Date: 2023.09.25 09:39:10 -05'00'</small>  <small>AMSJM-MLT</small>		<b>DO NOT SCALE</b>		<b>AUGUST 2005</b>	
<small>APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND</small>  <b>BRAILSFORD.KEITH H.ANTHONY.10286 55661</b>  <small>Digitally signed by BRAILSFORD.KEITH.ANTHONY. 1028655661 Date: 2023.09.28 17:54:12 -05'00'</small>  <small>DEFENSE AMMUNITION CENTER</small>		<small>DESIGN ENGINEER</small>	<small>BASIC REV.</small>	<b>MICHAEL BARTOSIAK SPENCER HOVEY</b>	
<small>TEST ENGINEER</small>  <small>TEST REPORT</small>		<small>ENGINEERING DIVISON</small>		<small>REVISION NO. 4</small>	
<small>EXPLOSIVES SAFETY DIRECTORATE</small>		<small>FIEFFER.LAUR A.A.1230375727</small>  <small>Digitally signed by FIEFFER.LAURA.A.1230375727 Date: 2023.08.14 06:42:05 -05'00'</small>		<small>AUGUST 2023</small>	
<small>FELICIANO.AD IN.1259200373</small>  <small>Digitally signed by FELICIANO.AD.IN.1259200373 Date: 2023.08.16 13:06:28 -05'00'</small>		<small>CLASS</small>		<small>SEE THE REVISION LISTING ON PAGE 2</small>	
<small>CUMMINS.PAU L.A.1231883122</small>  <small>Digitally signed by CUMMINS.PAULA.A.1231883122 Date: 2023.08.28 06:18:39 -05'00'</small>		<small>DIVISION</small>	<small>DRAWING</small>	<small>FILE</small>	
<b>19</b>		<b>48</b>	<b>4231/ 55</b>	<b>20PM1006</b>	

PALLET UNIT DATA				
ITEMS INCLUDED		*HAZARD CLASS AND DIVISION	*COMPATIBILITY GROUP	APPROX WEIGHT (LBS)
NSN	DODIC			
1320-01-534-2535	DA39	1.1	D	1,631
01-552-1850	DA45	1.1	D	1,631
01-611-6762	DA58	1.1	D	1,649
01-674-8814	DA71	1.1	D	1,631

\*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).

### REVISIONS

REVISION NO. 1, DATED DECEMBER 2006, CONSISTS OF CHANGES PER ECP R06A3001 INCLUDING:

1. UPDATING WIDTH OF PALLET PER CHANGES MADE TO PALLET AND PALLET ADAPTER BY ECP R05K3006.
2. ADDING ITEM BY NATIONAL STOCK NUMBER TO "PALLET UNIT DATA" CHART.
3. UPDATING LOADED CONTAINER WEIGHT FROM 155 LBS TO 156 LBS.
4. CORRECTING THE PALLET WEIGHT FROM 130 LBS TO 120 LBS.

REVISION NO. 2, DATED SEPTEMBER 2007, CONSISTS OF CHANGES PER ECP R07A3003 INCLUDING:

1. ADDING ITEM BY NATIONAL STOCK NUMBER TO "PALLET UNIT DATA" CHART.
2. ADJUSTING PICTORIALS OF "FILLER CONTAINER DETAILS" ON PAGE 4 TO CONDENSE THE DRAWING TO FOUR PAGES.

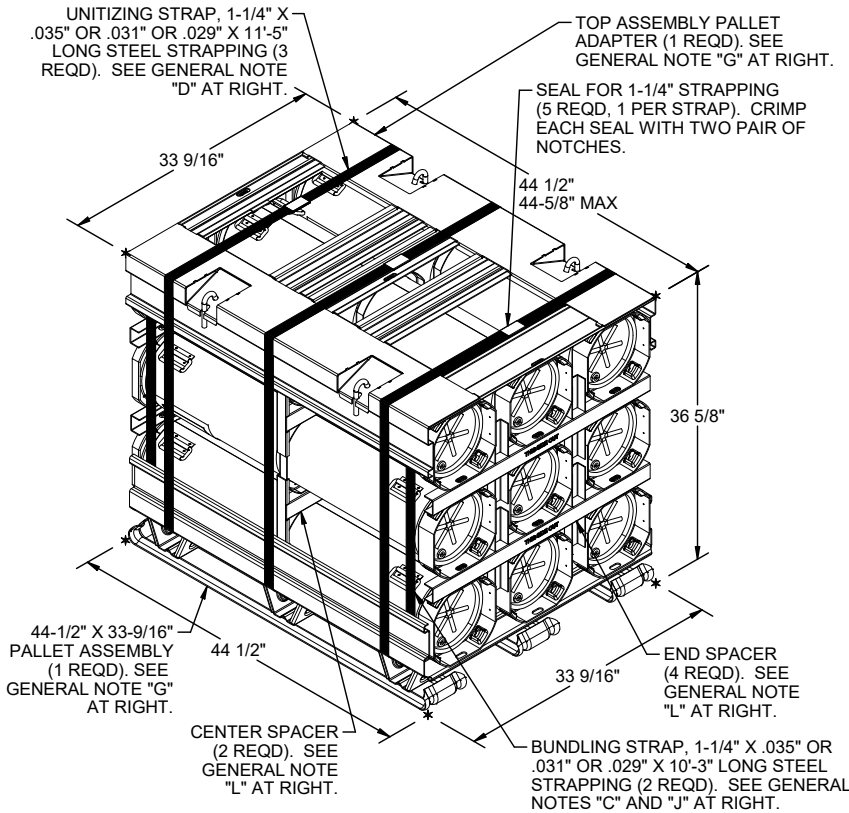
REVISION NO. 3, DATED FEBRUARY 2016, CONSISTS OF:

1. REMOVING "XM" DESIGNATION TO ITEM DESCRIPTION.
2. ADDING HANDLES TO EXCALIBUR CONTAINERS AS DETAILED IN ECP 030381.
3. CORRECTING THE PALLET UNIT DATA WEIGHT FROM 1649 LBS TO 1631 LBS IN THE "PALLET UNIT DATA" CHART.
4. CORRECTING THE CONTAINER WEIGHT AND TOTAL WEIGHT IN THE LOAD AS SHOWN ON PAGE 3.
5. ADDING ITEM BY NATIONAL STOCK NUMBER TO "PALLET UNIT DATA" CHART.

REVISION NO. 4, DATED AUGUST 2023, CONSISTS OF CHANGES PER ECP 030433 INCLUDING:

1. ADDING ITEMS BY NATIONAL STOCK NUMBER TO "PALLET UNIT DATA" CHART.

**GENERAL NOTES**



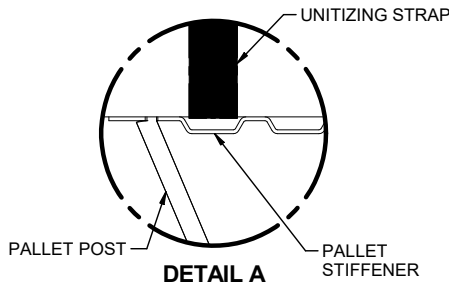
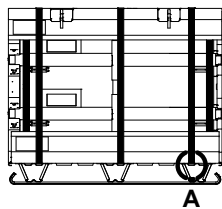
**PALLET UNIT**

SEE GENERAL NOTE "B" AT RIGHT.

9 CONTAINERS OF PROJECTILES (1 PER CNTR) @ 154 LBS	--	1,386 LBS
DUNNAGE	----	125 LBS
PALLET	----	120 LBS
<b>TOTAL WEIGHT</b>	-----	<b>1,631 LBS (APPROX)</b>
<b>CUBE</b>	-----	<b>31.7 CU FT (APPROX)</b>

**BILL OF MATERIAL**

PALLET, 44-1/2" X 33-9/16"	- 1 REQD	-----	120 LBS
TOP ASSEMBLY PALLET ADAPTER	- 1 REQD	-----	75 LBS
END SPACER ASSEMBLY	- 4 REQD	-----	27 LBS
CENTER SPACER ASSEMBLY	- 2 REQD	-----	15 LBS
STEEL STRAPPING, 1-1/4"	- 54.75' REQD	-----	8.3 LBS
SEAL FOR 1-1/4" STRAPPING	- 5 REQD	-----	NIL



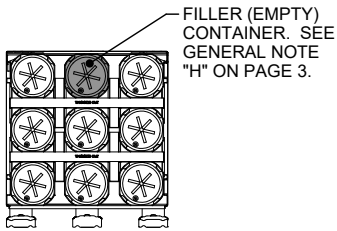
**APPLICATION OF UNITIZING STRAPS DETAIL**

SEE GENERAL NOTE "D" ABOVE.

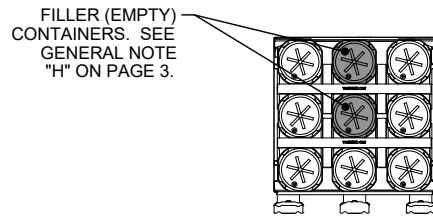
- A. THIS APPENDIX CANNOT STAND ALONE BUT MUST BE USED IN CONJUNCTION WITH THE BASIC UNITIZATION PROCEDURES DRAWING 19-48-4231-20PM1006. TO PRODUCE AN APPROVED UNIT LOAD, ALL PERTINENT PROCEDURES, SPECIFICATIONS AND CRITERIA SET FORTH WITHIN THE BASIC DRAWING WILL APPLY TO THE PROCEDURES DELINEATED IN 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. BUNDLING STRAPS MUST BE TENSIONED AND SEALED PRIOR TO THE APPLICATION OF THE UNITIZING STRAPS. INSTALL BUNDLING STRAPS AS CLOSE TO THE OUTER CONTAINER RINGS AS POSSIBLE, TO AVOID DAMAGE TO THE CONTAINERS.
- D. UNITIZING STRAPS WILL BE APPLIED BY FEEDING THE STRAPPING THROUGH THE PALLET STIFFENER SLOTS THAT RESIDE BETWEEN THE PALLET POSTS. FOR MORE INFORMATION, SEE THE "APPLICATION OF UNITIZING STRAPS DETAIL" BELOW. **CAUTION:** IMPROPER APPLICATION OF THE UNITIZING STRAPS THROUGH THE PALLET STIFFENER SLOTS COULD CREATE AN UNSAFE UNIT LOAD.
- E. THE FOLLOWING AMC DRAWINGS ARE APPLICABLE FOR OUTLOADING AND STORAGE OF THE ITEMS COVERED BY THIS APPENDIX.
 

CARLOADING	----	19-48-4242/55-5PM1004
TRUCKLOADING	----	19-48-4243/55-11PM1004
STORAGE	----	19-48-4250/55-1-2-3-4-14-22PM1004
END OPENING ISO CONTAINER	----	19-48-4245/55-15PM1009
MILVAN	----	19-48-4244/55-15PM1008
SIDE OPENING ISO CONTAINER	----	19-48-4272/55-15PM1016

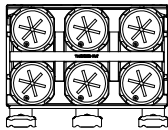
- F. IF ITEMS COVERED HEREIN ARE UNITIZED PRIOR TO ISSUANCE OF THIS REVISION TO THIS APPENDIX, THE CONTAINERS NEED NOT BE REUNITIZED SOLELY TO CONFORM TO THIS REVISION.
- G. FOR DETAILS OF THE PALLET AND TOP ASSEMBLY PALLET ADAPTER, SEE DAC DRAWING ACV00681, ACV00683, AND ACV00685 AND ARDEC ADACV00681.
- H. EMPTY OR REJECT PA179 CONTAINERS WILL BE USED AS FILLER CONTAINERS AS NECESSARY TO COMPLETE A UNIT LOAD. FOR DETAILS ON THE CORRECT POSITIONS WITHIN THE UNIT LOAD TO PLACE THE FILLER CONTAINERS, SEE THE "FILLER CONTAINER DETAILS" ON PAGE 4. WHEN (EMPTY) FILLER CONTAINERS ARE USED IN PLACE OF UNLOADED CONTAINERS, THEY WILL BE MARKED AS SPECIFIED IN ARDEC DRAWING 12982865.
- J. WHEN UNITIZING LOADS OF ONLY FOUR TO SIX LOADED CONTAINERS, ONE LAYER OF CONTAINERS WILL BE REMOVED RESULTING IN A SHORT (TWO LAYER) PALLET UNIT. THE TWO BUNDLING STRAPS WILL ENCOMPASS THE SIX CONTAINERS IN THE SHORT PALLET UNIT. FOR UNIT LOADS THAT WOULD RESULT IN THREE OR LESS LOADED CONTAINERS, A FULL PALLET UNIT OF NINE CONTAINERS WILL BE BROKEN DOWN TO MAKE TWO PALLET UNITS OF SIX CONTAINERS. FOR MORE DETAILS ON SHORT PALLET UNITS, SEE "FILLER CONTAINER DETAILS" ON PAGE 4.
- K. FOR DETAILS OF THE PA179 CONTAINER SEE ARDEC DRAWING 13001473.
- L. END SPACERS AND CENTER SPACERS ARE REQUIRED TO SEPARATE THE PA179 CONTAINERS TO MEET INSENSITIVE MUNITIONS REQUIREMENTS. THE END SPACERS ARE MARKED WITH "THIS SIDE OUT" TO ASSIST IN THE PROPER ORIENTATION OF THE END SPACERS. THE CENTER SPACERS ARE MARKED WITH "TOWARDS COVER" TO ENSURE THE SPACERS ARE ORIENTED TOWARDS OPENING END OF THE CONTAINER WITH THE COVER. FOR DETAILS OF THE END SPACERS OR THE CENTER SPACERS, SEE DAC DRAWING ACV00702. FOR FURTHER INFORMATION ON THE ORIENTATION OF THE SPACERS, SEE THE "SPACER ALIGNMENT DETAIL" ON PAGE 4.
- M. UNITIZATION OF PA179 CONTAINERS ON RESIN-TREATED PALLETS WILL NOT BE SHOWN AT THIS TIME. THE METHOD USED ON OTHER METAL BOTTOM ADAPTERS CANNOT BE USED ON THIS UNITIZATION BECAUSE THIS DESIGN DOES NOT HAVE A SEPARATE BOTTOM ADAPTER ASSEMBLY. ALTERNATIVE METHODS FOR UNITIZING PA179 CONTAINERS ON RESIN-TREATED PALLETS WILL REQUIRE MIL-STD-1660 TESTING PRIOR TO APPROVAL AND USE.



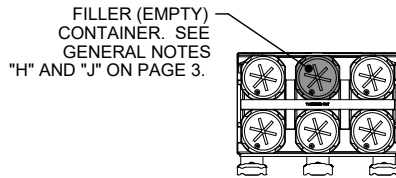
**EIGHT LOADED CONTAINER DETAIL**



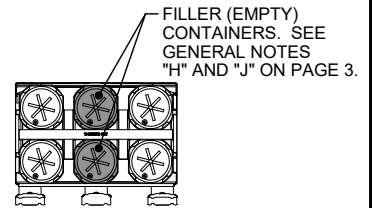
**SEVEN LOADED CONTAINER DETAIL**



**SHORT PALLET - SIX LOADED CONTAINERS**



**FIVE LOADED CONTAINER DETAIL**

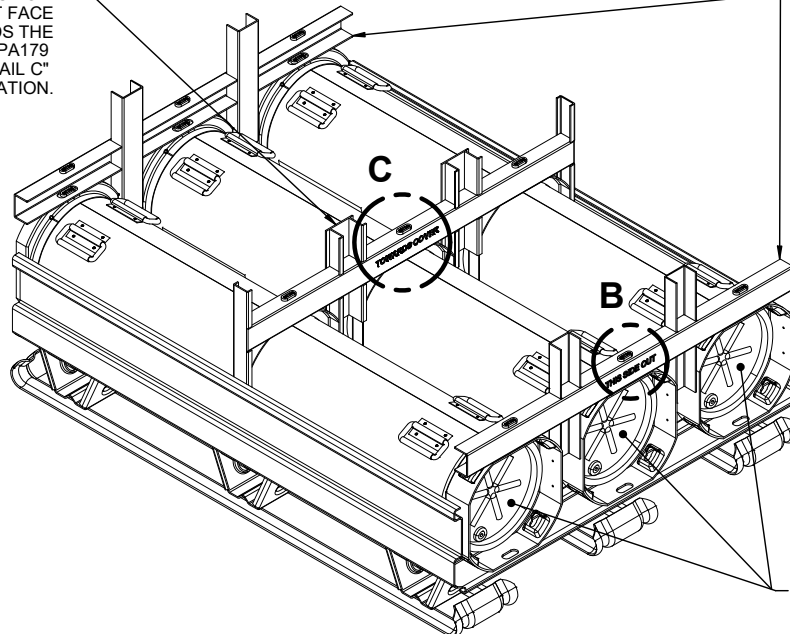


**FOUR LOADED CONTAINER DETAIL**

**FILLER CONTAINER DETAILS**

CENTER SPACERS ARE MARKED "TOWARDS COVER" ON FACE OF SPACER TO ORIENT THAT FACE OF THE SPACER TOWARDS THE COVER END OF THE PA179 CONTAINERS. SEE "DETAIL C" FOR MORE INFORMATION.

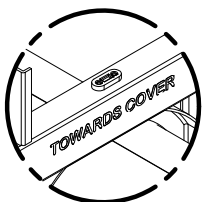
END SPACERS ARE MARKED "THIS SIDE OUT" ON FRONT FACE OF THE SPACER TO ORIENT SO THAT THE MARKING IS VISIBLE WHEN PALLET UNIT IS FULLY ASSEMBLED. SEE "DETAIL B" FOR MORE INFORMATION.



COVER END OR OPENING END OF THE PA179 CONTAINERS.



**DETAIL B**



**DETAIL C**

**SPACER ALIGNMENT DETAIL**  
SEE GENERAL NOTE "L" ON PAGE 3.