

UNITIZATION PROCEDURES FOR 152MM CARTRIDGE, PACKED ONE PER CYLINDRICAL METAL CONTAINER, PA64, UNITIZED TWENTY PER 35" X 45-1/2" 4-WAY ENTRY PALLET

PALLET UNIT DATA						
ITEMS INCLUDED		HAZARD CLASSIFICATION				WEIGHT (LBS)
NSN	DODIC	DOT CLASS	CG CLASS	QD CLASS	COMP GROUP	
1320-						
01-027-1147	D383	B	II-B	1.3	C	1,856
00-610-1323	D381	A	IV	1.1	E	2,096

REVISION

REVISION NO. 1, DATED MARCH 1978, CONSISTS OF:

1. CHANGING CONTAINER DIMENSIONS.
2. CHANGING UNITIZATION PROCEDURES TO CONFORM TO 1 ABOVE AND TO PRESENT UNITIZATION STANDARDS.

DO NOT SCALE

REVISIONS				QUARTSMAN	PROJ. ENG.
				<i>DR/mw</i>	<i>IDS/JNV</i>
				CHECKED	LOG ENGRG OFFICE
				<i>GRG/BK/A</i>	<i>DR - Eng'g</i>
1	MAR 78	<i>DR/MS</i>	<i>L. Kruter</i>	APPROVED	
			<i>AT Ehinger</i>	<i>Robert V. Smith</i> U. S. ARMY ARMAMENT COMMAND	
				APPROVED BY ORDER OF COMMANDING GENERAL, U. S. ARMY MATERIEL COMMAND <i>AT Ehinger</i> USAMC AMMO CENTER	
				U. S. ARMY MATERIEL COMMAND	
				SEPTEMBER 1975	
				CLASS	DIVISION
				DRAWING	FILE
				19	48
				4136	20 PM 1000

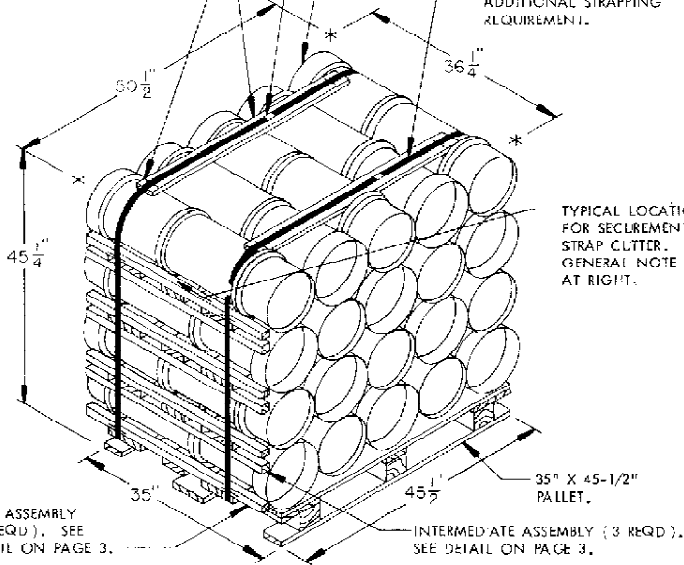
SEAL FOR 1-1/4" STRAPPING (2 REQD, 1 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES.

STRAPPING BOARD, 1" X 4" X 40" (2 REQD).

STAPLE FOR 1-1/4" STRAPPING (12 REQD, 6 PER STRAP).

ADJACENT CONTAINERS WILL BE REVERSED BELL TO BASE BOTH Laterally AND VERTICALLY.

UNITIZING STRAP, 1-1/4" X .031" OR .035" X 16'-2" LONG STEEL STRAPPING (2 REQD). SEE "UNITIZATION PROCEDURES" ON PAGE 3. SEE GENERAL NOTE "K" AT RIGHT FOR AN ADDITIONAL STRAPPING REQUIREMENT.



PALLET UNIT

20 EACH 152MM CARTRIDGE IN CONTAINER @ 85 LBS	1,700 LBS
DUNNAGE	89 LBS
PALLET	65 LBS
TOTAL WEIGHT	1,854 LBS (APPROX)
CUBE	47.9 CU FT

MATERIAL SPECIFICATIONS

- PALLET** ----- : MIL SPEC MIL-P-15011; STYLE 1A (4-WAY ENTRY, SIZE 35" X 45-1/2"), TYPE I, CLASS 1, PRESERVATIVE TREATED.
- LUMBER** ----- : TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-1-751; FOR FILLER ASSEMBLIES, MIL-STD-731; CLASS 2, GROUP II, III, OR IV, PRESERVATIVE TREATED FOR STRAPPING BOARDS AND BASE AND INTERMEDIATE ASSEMBLIES. NOTE: ONLY GROUP IV WOODS WILL BE ACCEPTABLE FOR THE CONSTRUCTION OF THE PALLET.
- STRAPPING, STEEL** ---- : FED SPEC QQ-S-781; CLASS 1, TYPE II OR IV, HEAVY DUTY, FINISH B (GRADE 2), (1-1/4" X .035" OR .031").
- STAPLE, STRAP** ----- : FED SPEC FF-N-105; TYPE III, STYLE 3, SIZE 1-17/32" WIDE BY 3/4" LEG LENGTH, OR EQUIVALENT.
- SEAL, STRAP** ----- : FED SPEC QQ-S-781; TYPE D, STYLE I, II, OR IV, CLASS II.
- NAILS** ----- : FED SPEC FF-N-105; COMMON, CEMENT COATED OR CHEMICALLY TREATED. ALT: ANNULAR RING TYPE NAIL OF THE SAME SIZE.

GENERAL NOTES

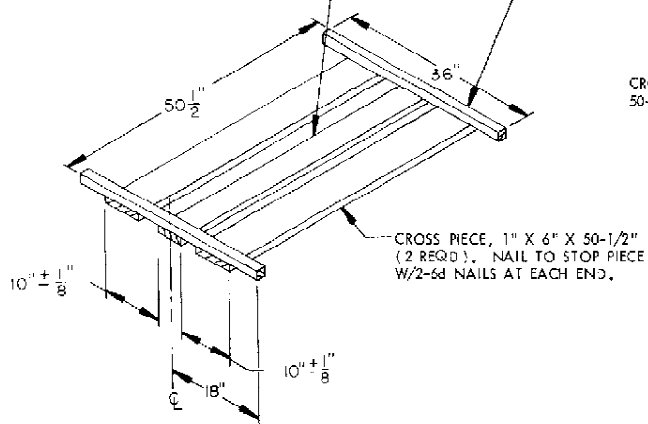
- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1, AND AUGMENTS TM 743-200-1 (CHAPTER 5) AND MIL-STD-1660.
- B. DIMENSIONAL LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE UNLESS OTHERWISE SPECIFIED. FOR EXAMPLE, 1" X 4" MATERIAL IS ACTUALLY 3/4" THICK BY 3-1/2" WIDE.
- C. IF LESS THAN 70 CONTAINERS ARE LOADED INTO A PALLET UNIT, IT MAY BE ACCOMPLISHED BY OMITTING COMPLETE LAYERS FROM THE PALLET UNIT (FIVE, TEN, OR FIFTEEN CONTAINERS). FOR REDUCING THE PALLET UNIT BY ONE (1) THRU FOUR (4) CONTAINERS, SEE "PROVISIONS FOR LESS-THAN-FULL-LAYER PALLET UNIT" ON PAGE 4.
- D. FOR ADDITIONAL GUIDANCE, SEE THE "UNITIZATION PROCEDURES" ON PAGE 3.
- E. ALL STRAPPING MUST BE STRAIGHT WITHIN TWO INCHES (2") ON ANY SURFACE OF THE UNITIZED LOAD; IE, TOP, BOTTOM, SIDES OR ENDS THAT IT ENCOMPASSES. EACH STRAP WILL BE TENSIONED SUFFICIENTLY TO SLIGHTLY CRUSH THE EDGES OF THE PALLET UNIT.
- F. UNLESS OTHERWISE SPECIFIED, A MANUFACTURING TOLERANCE OF + OR - 1/8" IS ALLOWED ON ALL DIMENSIONS. ALTHOUGH A + OR - 1/4" TOLERANCE IS ALLOWED, ALL DIMENSIONAL LUMBER MEMBERS IN A SET, SUCH AS CROSS PIECES IN AN INTERMEDIATE ASSEMBLY, MUST BE WITHIN 1/8" OF THE SAME LENGTH.
- G. WHEN ASSEMBLING A COMPLETE PALLET UNIT, CARE SHALL BE TAKEN TO INSURE THAT THE CONTAINERS AND ASSEMBLIES ARE EVENLY ALIGNED HORZONTALLY AND VERTICALLY SO THAT THE SIDES AND ENDS OF THE PALLET UNIT DO NOT EXCEED A 1/2" TOLERANCE.
- H. THE UNITIZATION PROCEDURES DEPICTED HEREIN MAY ALSO BE USED FOR UNITIZING 152MM CARTRIDGES WHEN IDENTIFIED BY DIFFERENT NATIONAL STOCK NUMBERS (NSN) THAN WHAT IS SHOWN ON THE TITLE PAGE, PROVIDED THE CONTAINER DOES NOT VARY FROM WHAT IS DELINEATED HEREIN. THE EXPLOSIVE CLASSIFICATION OF OTHER ITEMS MAY BE DIFFERENT THAN WHAT IS SHOWN.
- J. WHEN APPLYING ANY STRAP, CARE MUST BE EXERCISED TO ASSURE THAT THE END OF THE STRAP ON THE UNDERSIDE OF THE JOINT EXTENDS AT LEAST 6" BEYOND THE SEAL. THE EXTRA MINIMUM LENGTH OF STRAP IS REQUIRED TO PERMIT SUBSEQUENT TIGHTENING OF LOOSENEED STRAPPING. 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. FOR METHOD OF SECURING A STRAP CUTTER TO THE PALLET UNIT, SEE DARCOM DRAWING 19-48-1127-20P1000.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	6.67	2.22
1" X 6"	50.50	25.25
2" X 2"	42.00	14.00
NAILS	NO. REQD	POUNDS
6d (2")	30	.18
10d (3")	36	.55
PALLET, 35" X 45-1/2", HARDWOOD	1 EA	65 LBS
STEEL STRAPPING, 1-1/4" X .035"	32.33 REQD	4,61 LBS
SEAL FOR 1-1/4" STRAPPING	2 REQD	NIL
STAPLE FOR 1-1/4" STRAPPING	12 REQD	NIL

CENTER CROSS PIECE, 1" X 4-3/4" ± 1/8" (ACTUAL WIDTH) X 50-1/2" (1 REQD). CENTER ON STOP PIECE AND NAIL W/2-6d NAILS AT EACH END.

STOP PIECE, 2" X 2" X 36" (2 REQD).

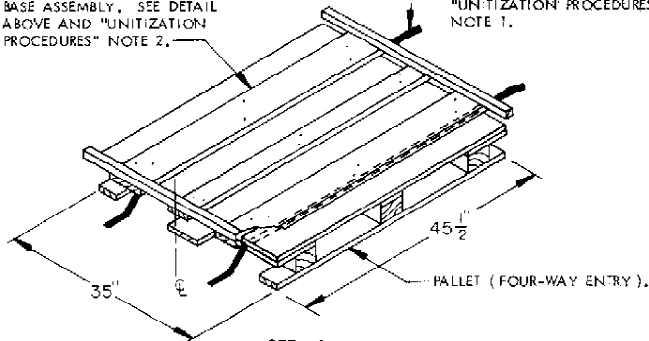


BASE ASSEMBLY

(1 REQD)

BASE ASSEMBLY, SEE DETAIL ABOVE AND "UNITIZATION PROCEDURES" NOTE 2.

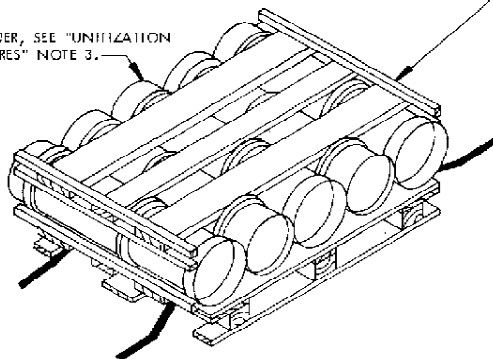
UNITIZING STRAP, 1-1/4" X .035" OR .031" X 16'-0" (2 REQD), SEE "UNITIZATION PROCEDURES", NOTE 1.



STEP 1

CONTAINER, SEE "UNITIZATION PROCEDURES" NOTE 3.

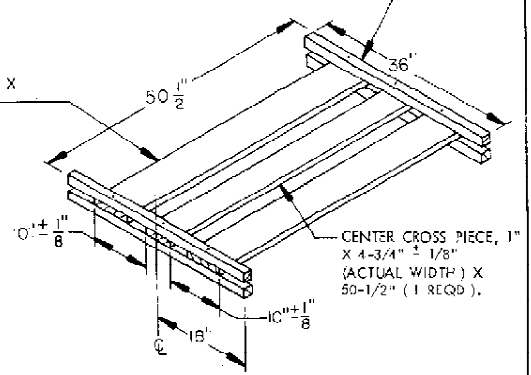
INTERMEDIATE ASSEMBLY, SEE DETAIL ABOVE AND "UNITIZATION PROCEDURES" NOTE 4.



STEP 2

STOP PIECE, 2" X 2" X 36" (4 REQD). NAIL THROUGH THE TOP STOP PIECE AND THRU A CROSS PIECE INTO THE BOTTOM STOP PIECE W/1-10d NAIL AT EACH JOINT. THE NAIL WILL BE OFFSET SLIGHTLY TO ONE SIDE OF THE CROSS PIECE. TURN THE DUNNAGE ASSEMBLY OVER AND NAIL THRU EACH JOINT IN THE OPPOSITE DIRECTION W/1-10d NAIL IN EACH JOINT SO AS NOT TO CONTACT NAILS THAT WERE PREVIOUSLY INSTALLED.

CROSS PIECE, 1" X 6" X 50-1/2" (2 REQD).



INTERMEDIATE ASSEMBLY

(3 REQD)

UNITIZATION PROCEDURES

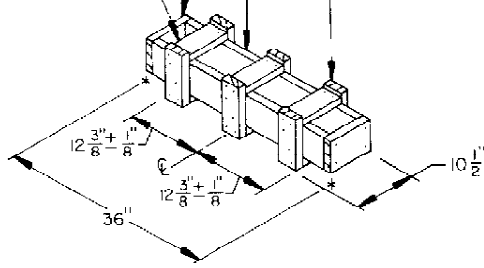
1. THREAD 1-1/4" STRAP THROUGH STRAP SLOTS OF PALLET AS SHOWN IN STEP 1. NOTE THAT IF DESIRED, STRAPPING CAN BE INSTALLED AFTER CONTAINERS ARE STACKED ON A PALLET.
2. CENTER "BASE ASSEMBLY" ON PALLET DECK AS SHOWN IN STEP 1 AND NAIL THRU CROSS PIECES TO PALLET STRINGER BOARDS W/2-6d NAILS AT EACH JOINT. DO NOT NAIL THRU STRAP SLOTS.
3. POSITION THE FIRST LAYER OF CONTAINERS SO THAT THE OPENING ENDS OF ADJACENT CONTAINERS FACE IN OPPOSITE DIRECTIONS, BELL TO BASE END AS SHOWN.
4. PLACE THE "INTERMEDIATE ASSEMBLY" ON FIRST LAYER OF CONTAINERS MAKING CERTAIN IT IS IN VERTICAL ALIGNMENT WITH THE "BASE ASSEMBLY".
5. POSITION SECOND LAYER OF CONTAINERS ON "INTERMEDIATE ASSEMBLY" SO THAT THE OPENING ENDS OF Laterally AND VERTICALLY ADJACENT CONTAINERS FACE IN OPPOSITE DIRECTIONS; BELL-TO-BASE END. REPEAT PROCEDURES UNTIL FULL PALLET UNIT IS ASSEMBLED.
6. AFTER PALLET IS LOADED WITH CONTAINERS, POSITION "STRAPPING BOARD" IN VERTICAL ALIGNMENT WITH BASE AND INTERMEDIATE ASSEMBLIES. POSITION STRAPPING IN VERTICAL ALIGNMENT AROUND THE UNIT. SEAL STRAP AND STAPLE STRAP TO ASSEMBLIES AND STRAPPING BOARD AS SHOWN IN THE "PALLET UNIT" DETAIL ON PAGE 2.

LATERAL PIECE, 2" X 6" X 7-1/2" (2 REQ'D).
NAIL TO THE LONGITUDINAL PIECES
W/2-10d NAILS AT EACH
END.

TIE PIECE, 2" X
4" X 7-1/2" (6
REQ'D). NAIL TO
THE LONGITUDINAL
PIECES W/2-10
NAILS AT EACH END.

LONGITUDINAL PIECE,
2" X 6" X 33" (2 REQ'D).

SUPPORT PIECE, 2" X 4" X 9" (6 REQ'D).
NAIL TO THE LONGITUDINAL PIECE
W/2-10d NAILS AND TO THE TIE PIECES
W/2-10d NAILS AT EACH END.



FILLER ASSEMBLY A

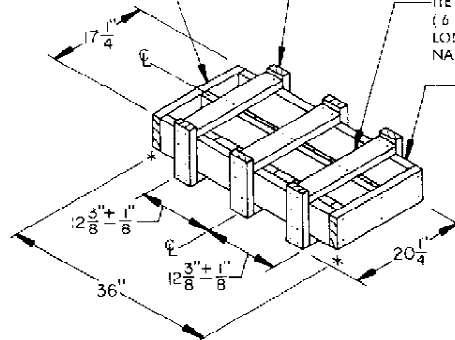
(FOR MINUS ONE CONTAINER)

LATERAL PIECE, 2" X 6" X 17-1/4" (7 REQ'D). NAIL TO THE
LONGITUDINAL PIECES W/2-10d NAILS AT EACH JOINT.

SUPPORT PIECE, 2" X 4" X 9" (6 REQ'D).
NAIL TO THE LONGITUDINAL PIECE W/2-10d
NAILS AND TO THE TIE PIECES W/2-10d
NAILS AT EACH END.

TIE PIECE, 2" X 4" X 17-1/4"
(6 REQ'D). NAIL TO THE
LONGITUDINAL PIECES W/2-10d
NAILS AT EACH JOINT.

LONGITUDINAL PIECE, 2"
X 6" X 33" (3 REQ'D).



FILLER ASSEMBLY B

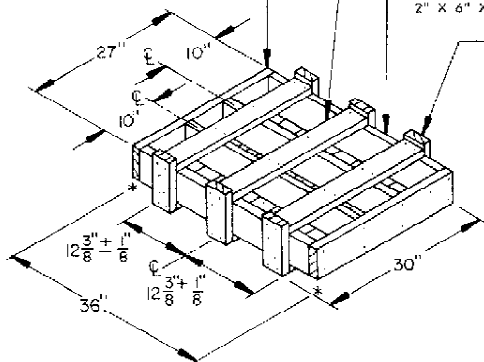
(FOR MINUS TWO CONTAINERS)

LATERAL PIECE, 2" X 6" X 27" (2 REQ'D).
NAIL TO THE LONGITUDINAL PIECES W/2-10d
NAILS AT EACH JOINT.

TIE PIECE, 2" X 4" X 27"
(6 REQ'D). NAIL TO THE
LONGITUDINAL PIECES
W/2-10d NAILS AT EACH
JOINT.

LONGITUDINAL PIECE,
2" X 6" X 33" (4 REQ'D).

SUPPORT PIECE, 2" X 4"
X 9" (6 REQ'D). NAIL
TO THE LONGITUDINAL
PIECE W/2-10d NAILS
AND TO THE TIE PIECES
W/2-10d NAILS AT
EACH END.

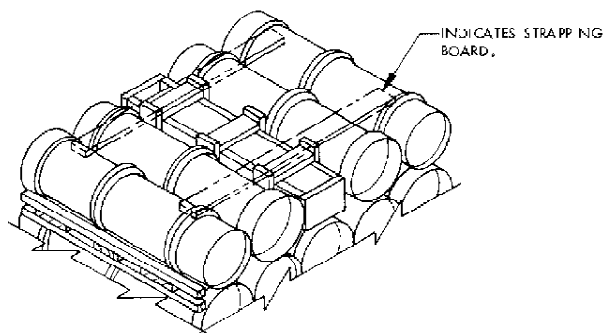


FILLER ASSEMBLY C

(FOR MINUS THREE CONTAINERS)

PROVISIONS FOR LESS-THAN-FULL-LAYER PALLET UNITS

1. THESE PROVISIONS SET FORTH THE SPECIFICATIONS THAT MUST BE FOLLOWED IF FILLER-TYPE ASSEMBLIES ARE USED TO ACHIEVE A FULL-LAYER PALLET UNIT.
2. IF A PALLET UNIT IS REQUIRED MINUS ONE (1), TWO (2) OR THREE (3) CONTAINERS, USE THE APPROPRIATE FILLER ASSEMBLY TO FILL THE VOID. THIS ASSEMBLY MUST BE INSTALLED IN THE TOP LAYER OF THE PALLET UNIT AND MUST HAVE THE SUPPORT PIECES IN VERTICAL ALIGNMENT WITH THE CROSS PIECES OF THE INTERMEDIATE ASSEMBLY BELOW IT.
3. IF A PALLET UNIT MINUS FOUR (4) CONTAINERS IS DESIRED, USE TWO (2) FILLER ASSEMBLIES TYPE B AS DETAILED ABOVE. INSTALL THE TWO ASSEMBLIES IN THE TOP TWO LAYERS OF THE PALLET UNIT IN VERTICAL ALIGNMENT.
4. WHEN INSTALLING THE STRAPPING BOARD, ALIGN WITH THE SUPPORT PIECES OF THE FILLER ASSEMBLY, AS SHOWN IN "TYPICAL INSTALLATION OF FILLER ASSEMBLY" TO THE LEFT.
5. EMPTY CONTAINERS, PREFERABLY "REJECTS" CAN BE USED INSTEAD OF THE WOODEN DUNNAGE ASSEMBLIES SPECIFIED ON THIS PAGE, TO ACHIEVE A FULL-LAYER CONFIGURATION. WHEN AN EMPTY CONTAINER IS USED TO FILL OUT A LAYER ON A PALLET UNIT, THE EMPTY CONTAINER WILL BE PAINTED ORANGE. ALSO, THE WORD "EMPTY" WILL BE STENCILED IN BLACK ON THE EMPTY CONTAINER IN ONE-INCH (1") SIZE LETTERS. THE WORD "EMPTY" WILL BE STENCILED TWICE ON THE BELL PORTION OF THE CONTAINER WITH THE WORDS PAINTED ALONG THE CIRCUMFERENCE 180 DEGREES APART, AND STENCILED THREE TIMES ON THE BODY PORTION OF THE CONTAINER WITH THE WORDS PRINTED LENGTHWISE ON THE CONTAINER AND SPACED 120 DEGREES APART AS MEASURED AROUND THE CONTAINER CIRCUMFERENCE.
6. EACH PALLET UNIT CONTAINING ONE OR MORE EMPTY CONTAINERS WILL HAVE A WEATHER RESISTANT PLACARD APPLIED TO ONE SIDE AND ONE END. THE PLACARDS WILL BE STENCILED WITH A CONTRASTING COLOR, USING LETTERS THAT ARE AS LARGE AS PRACTICAL BUT NOT LESS THAN ONE-HALF-INCH (1/2") IN SIZE, TO READ: "THIS UNIT LOAD CONTAINS _____ EMPTY CONTAINER(S)".



TYPICAL INSTALLATION OF FILLER ASSEMBLY