

BASIC PROCEDURES

UNITIZING PROCEDURES FOR COMPLETE ROUNDS PACKED IN CYLINDRICAL COMPOSITE CONTAINERS WITH EXTERNAL INSENSITIVE MUNITION (IM) SEPARATORS ON 4-WAY ENTRY PALLET

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NOTICE: THIS BASIC PROCEDURE DRAWING WILL BE AUGMENTED BY SEPARATELY ISSUED APPENDICES BEARING THE DRAWING AND FILE NUMBERS OF THIS DOCUMENT. AN APPENDIX WILL DELINEATE THE APPROVED CONFIGURATION OF A UNIT LOAD FOR ONE ITEM OF AMMUNITION. APPENDICES CANNOT STAND ALONE, BUT MUST BE USED IN CONJUNCTION WITH THIS BASIC PROCEDURE DRAWING. THE DRAWING NUMBER OF EACH APPENDIX WILL CONTAIN A SUB-NUMBER FOR IDENTIFICATION (E. G., THE DRAWING NUMBER FOR APPENDIX 3 WILL BE 19-48-4352/3-20PM1013).

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U.S. ARMY MATERIEL COMMAND DRAWING

<p>APPROVED, U.S. ARMY FIELD SUPPORT COMMAND</p> <p style="text-align: right;"><i>J.P.R.</i></p> <p style="font-size: 1.5em; font-family: cursive;"><i>David A. Puskas</i></p> <p style="text-align: center; font-size: 0.8em;">AMSRD-AAR-AIL-TP</p>	<p>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 8.</p>						
<p>APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND</p> <p style="font-size: 1.5em; font-family: cursive;"><i>[Signature]</i></p> <p style="text-align: center; font-size: 0.8em;">AMSFS-ST</p>	<p>DO NOT SCALE</p>	<p>APRIL 2005</p>					
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U.S. ARMY DEFENSE AMMUNITION CENTER

GENERAL NOTES

(GENERAL NOTES CONTINUED)

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1, AND AUGMENTS TM 743-200-1 (CHAPTER 5) AND CONFORMS TO MIL-STD-1660.
- B. APPROVED SPECIFICATIONS, COVERING THE ASSEMBLAGE AND UNITIZATION OF COMPLETE ROUNDS INTO UNIT LOADS, ARE SET FORTH IN THIS DRAWING. THIS DRAWING WILL BE CONSIDERED THE BASIC DOCUMENT FOR THE UNITIZATION OF COMPLETE ROUNDS PACKED IN CYLINDRICAL COMPOSITE CONTAINERS, EXCEPT FOR SOME RESTRICTED ITEMS. THIS DOCUMENT INCLUDES MATERIAL SPECIFICATIONS AND UNITIZING STANDARDS APPLICABLE TO UNITIZATION, PLUS INFORMATION RELATIVE TO TYPICAL POSITIONING OF COMPLETE ROUNDS ON A PALLET AND INSTALLATION OF UNITIZING STEEL STRAPPING. FOR TYPICAL UNITIZATION PROCEDURES, SEE PAGE 6. ADDITIONALLY, "PROVISIONS FOR LESS-THAN-FULL-LAYER UNIT LOADS" ARE SPECIFIED ON PAGE 5.
- C. APPENDICES PERTAINING TO THIS BASIC DOCUMENT WILL BE ISSUED SEPARATELY. HOWEVER, ALL APPENDICES, ARE A PART OF THIS BASIC PROCEDURE DRAWING. EACH APPENDIX WILL COVER THE APPROVED CONFIGURATION FOR A UNIT LOAD, THE SPECIFIC UNITIZATION SPECIFICATIONS, AND THE PERTINENT TABULAR DATA FOR ONE SPECIFIC SERIES CONTAINER.
- D. GENERALLY, UNIT LOADS SHOWN IN THE APPENDICES WILL CONFORM TO THE STANDARDS LISTED BELOW.
- 1. GROSS WEIGHTS OF PALLETIZED UNIT LOADS ARE BASED ON AN OPTIMUM MAXIMUM WEIGHT OF 2,464 POUNDS, DUE TO MATERIALS HANDLING EQUIPMENT CONSIDERATIONS. UNLESS SPECIFICALLY RESTRICTED BY ANOTHER AUTHORITATIVE DOCUMENT, THE MAXIMUM GROSS WEIGHT OF AMMUNITION UNIT LOADS IS 4,000 POUNDS. MAXIMUM SIZE CRITERIA WILL BE AS SHOWN BY "SIZE CRITERIA" DETAIL ON PAGE 4.

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MATERIAL SPECIFICATIONS

- LUMBER - - - - - : ASTM D6199; CLASS 2, GROUP II, III, OR IV, FOR ALL DUNNAGE ASSEMBLIES. ALL LUMBER SHALL BE PRESERVATIVE AND HEAT TREATED. NOTE: ONLY GROUP IV LUMBER IN ACCORDANCE WITH ASTM D6199 WILL BE ACCEPTABLE FOR THE CONSTRUCTION OF THE PALLET. SEE GENERAL NOTES "U" ON PAGE 3 AND "Z" ON PAGE 4.
- PALLET - - - - - : MIL SPEC MIL-P-15011; 4-WAY ENTRY, STYLE 1, 1A OR 1B, TYPE I, CLASS 1, PRESERVATIVE AND HEAT TREATED. SEE GENERAL NOTE "Z" ON PAGE 4.
- 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 B (GRADE 2), DOUBLE NOTCH TYPE, STYLE I, II, III, OR IV. ALTERNATIVE SEAL FINISH: SIGNODE OR DELTA PAINTED SEALS MAY BE USED AS AN ALTERNATIVE IF ALL SURFACES ARE PAINTED. GRITTED BACKING IS NOT PERMITTED.
- NAILS - - - - - : ASTM F1667; COMMON STEEL NAIL (NLCMS OR NLCMMS). ALT: UNDERLAYMENT NAIL (NLUL), PALLET NAIL (NLPL), OR COOLER NAIL (NLCL) OF SAME SIZE. SEE GENERAL NOTE "W" ON PAGE 3.
- STAPLES - - - - - : ASTM F1667; STFCs-189 OR STFCs-207, 15/16" OR 1" CROWN WIDTH X 3/4" LEG LENGTH FOR 3/4" STRAPPING OR STFCs-224, 1-17/32" CROWN WIDTH X 3/4" LEG LENGTH FOR 1-1/4" STRAPPING. SEE GENERAL NOTE "AA" ON PAGE 4.

- 2. PALLETIZED UNITS OF COMPLETE ROUNDS ARE LIMITED TO NOT MORE THAN TWO LOTS PER UNIT, EXCEPT WHERE REQUIRED BY BALLISTIC SAMPLE SHIPMENT OR TROOP USE AT POST, CAMP, OR STATION. THESE UNITS ARE FURTHER RESTRICTED TO NOT MORE THAN ONE LOT PER CONTAINER WITHIN A PALLETIZED UNIT.
- 3. THE UNIT LOAD SHOULD EITHER SLIGHTLY OVERHANG OR BE FLUSH WITH THE PALLET ON ALL FOUR SIDES. WHEN IT IS NECESSARY TO ENLARGE THE LOAD TO MATCH THE DIMENSIONS OF THE PALLET, THE DUNNAGE ASSEMBLIES WILL BE CONSTRUCTED IN SUCH A MANNER THAT THE CONTAINERS ARE HELD IN PLACE AND THE PALLET IS FILLED OUT COMPLETELY.
- 4. A UNIT LOAD, SUCH AS THE LAST UNIT LOAD FOR AN AMMUNITION LOT, CANNOT BE ASSEMBLED WITH LESS LAYERS THAN SPECIFIED FOR THE BASIC UNIT LOAD. HOWEVER, EMPTY OR REJECT CONTAINERS WILL BE USED TO ACHIEVE FULL LAYER "LIGHT" UNIT LOADS. IF EMPTY OR REJECT CONTAINERS ARE NOT AVAILABLE, CONTAINERS CAN BE OMITTED PER THE SPECIFIC GUIDANCE FOR THE MAXIMUM NUMBER OF ALLOWABLE CONTAINERS PER UNIT LOAD AND THE PLACEMENT OF THE OMITTED CONTAINERS GIVEN IN THE APPENDIX DRAWING FOR THAT ITEM. FOR SPECIFIC GUIDANCE, SEE THE "PROVISIONS FOR LESS-THAN-FULL-LAYER UNIT LOADS" ON PAGE 5.
- E. ANY REQUEST FOR DEVIATION FROM THE STANDARDS DESCRIBED IN GENERAL NOTE "D" OR FROM THE PROCEDURES DELINEATED IN AN APPENDIX MUST BE DIRECTED TO THE COMMANDER, U.S. ARMY ARMAMENT RESEARCH, DEVELOPMENT AND ENGINEERING CENTER, ATTN: AMSRD-AAR-AIL-TP(R), ROCK ISLAND, IL 61299-7300, FOR SPECIFIC APPROVAL. FOR EXAMPLE, SPECIFIC APPROVAL MUST BE OBTAINED FOR UNITIZATION OF AN ITEM WHEN PACKED IN CYLINDRICAL COMPOSITE CONTAINERS WHICH ARE DIFFERENT IN SIZE THAN THOSE SHOWN IN THE APPENDIX FOR THAT ITEM, EVEN THOUGH THE UNIT LOAD MAY COMPLY WITH THE STANDARDS DESCRIBED IN GENERAL NOTE "D".
- F. COMPLETE ROUNDS IN COMPOSITE CONTAINERS UNITIZED PRIOR TO DISTRIBUTION OF THIS DRAWING OR OF AN APPENDIX THERETO, NEED NOT BE REUNITIZED SOLELY TO CONFORM TO THE STANDARDS SPECIFIED HEREIN OR TO THE METHOD SHOWN IN AN AUGMENTING APPENDIX. HOWEVER, CONTAINER AND STRAP ALIGNMENT MUST CONFORM WITH THE TOLERANCE STANDARDS SPECIFIED ON PAGE 7 OF THIS DRAWING BEFORE A UNIT IS ACCEPTABLE FOR SHIPMENT. ALSO, THE CONDITION OF THE UNITIZING STRAPPING ON A UNIT LOAD MUST COMPLY WITH THE CRITERIA OF GENERAL NOTE "N" ON PAGE 3.
- G. UNIT LOADS MUST ONLY BE MADE UP WITH FULL LAYERS. HOWEVER, FOR REDUCED QUANTITIES, PREFERABLY EMPTY OR REJECT CONTAINERS WILL BE USED TO FILL OUT A LAYER. IF EMPTY OR REJECT CONTAINERS ARE NOT AVAILABLE, ONE OR MORE CONTAINERS CAN BE OMITTED, SEE THE "PROVISIONS FOR LESS-THAN-FULL LAYER UNIT LOADS" ON PAGE 5. ONLY ONE PALLETIZED UNIT HAVING A REDUCED QUANTITY OF CONTAINERS SHOULD BE PERMITTED PER LOT FOR THAT ITEM. CARE SHALL BE TAKEN TO INSURE THAT REDUCED-QUANTITY UNITS ARE EVENLY ALIGNED HORIZONTALLY AND VERTICALLY SO THAT THE SIDES AND ENDS OF THE UNIT LOAD DO NOT EXCEED A 1/2" TOLERANCE, RELATIVE TO THE PALLET. SEE "UNIT ASSEMBLY TOLERANCES" DETAILS ON PAGE 7.
- H. DIMENSIONAL LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF A NOMINAL SIZE UNLESS OTHERWISE SPECIFIED, FOR EXAMPLE, 1" X 4" MATERIAL IS ACTUALLY 3/4" THICK BY 3-1/2" WIDE AND 2" X 4" MATERIAL IS ACTUALLY 1-1/2" THICK BY 3-1/2" WIDE. NOTE: IF THE 1" X 2", 2" X 2", OR 2" X 3" DUNNAGE LUMBER SPECIFIED IN THE APPENDICES IS NOT READILY AVAILABLE, TWO ACCEPTABLE SIZE DUNNAGE PIECES CAN BE MADE BY RIPPING (SAWING) A PIECE OF NOMINAL SIZE 1" X 4", 2" X 4", OR 2" X 6" LUMBER, RESPECTIVELY, ON THE CENTER LINE OF ITS WIDTH.
- J. UNLESS OTHERWISE SPECIFIED, A PLUS-OR-MINUS 1/4" IS ALLOWED ON OVERALL DIMENSIONS OF ANY PIECE OF DUNNAGE OR DUNNAGE ASSEMBLY. HOWEVER, SIMILAR PIECES IN AN ASSEMBLY MUST BE WITHIN 1/8" OF THE SAME DIMENSION.
- K. 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 STRAPPING BOARDS OR TOP DUNNAGE ASSEMBLY AND THE PALLET WITHOUT DAMAGING THE CONTAINER OR CONTENTS. AFTER TENSIONING, ALL STRAPS WILL BE SECURED USING ONE SEAL AND TWO PAIR OF NOTCHES PER SEAL. SEE THE "UNIT ASSEMBLY TOLERANCES DETAILS" ON PAGE 7. SEALS MAYBE LOCATED ON A SIDE OR ON THE TOP OF THE UNIT, AS REQUIRED BY OPERATIONAL NECESSITY.

(CONTINUED ON PAGE 3)

- L. 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 TIGHTENING OF LOOSENED STRAPPING. RETENSIONING CAN BE ACCOMPLISHED WITHOUT REPLACING STRAPPING OR SPLICING STRAPPING THROUGH THE USE OF A MANUAL OR PNEUMATIC FEEDWHEEL TYPE TENSIONING TOOL AND THE APPLICATION OF ONE ADDITIONAL SEAL. SEE "STRAP RETENSIONING TAB" VIEW ON PAGE 6.
- M. DETERMINATION OF LENGTH OF STRAPPING. THE FOLLOWING DEFINITIONS APPLY:
- L=LENGTH OF STRAP REQUIRED IN INCHES.
 A=LENGTH OF UNIT IN INCHES.
 W=WIDTH OF UNIT IN INCHES.
 H=HEIGHT OF UNIT, INCLUDING PALLET, IN INCHES.
1. THE LENGTH OF A LOAD STRAP REQUIRED FOR A SPECIFIC UNIT, WHERE THE STRAP PASSES THROUGH THE STRAP SLOT OR ABOVE THE PALLET DECK, WILL BE DETERMINED USING THE FOLLOWING FORMULA: $L=2W + 2H + 2"$.
 2. THE LENGTH OF A TIEDOWN STRAP REQUIRED FOR A SPECIFIC UNIT, WHERE THE STRAP PASSES UNDER THE PALLET DECK, WILL BE DETERMINED BY USING THE FOLLOWING FORMULA: $L=2A + 2H + 2"$.
 3. THE LENGTH OF A HORIZONTAL STRAP REQUIRED FOR A SPECIFIC UNIT, WHERE THE STRAP ENCIRCLES THE UNIT LOAD, WILL BE DETERMINED BY USING THE FOLLOWING FORMULA: $L = 2A + 2H + 12"$.
- N. PALLET UNIT LOADS SHALL BE INSPECTED FOR TORN, DETERIORATED OR LOOSENED STRAPPING PRIOR TO SHIPPING.
1. TORN OR BROKEN STRAPS SHOULD BE REPLACED OR REPAIRED BY SPLICING IN A MANNER SIMILAR TO THAT DESCRIBED IN 4 (B) BELOW.
 2. DETERIORATION DUE TO A MINOR AMOUNT OF RUST WILL NOT NECESSARILY BE CAUSE FOR REPLACING A STRAP. HOWEVER, AN EXTENSIVELY RUSTED/SCALED/PITTED STRAP IS CAUSE FOR REPLACING STRAP.
 3. A DAMAGED OR DEFECTIVE SEAL IS SUFFICIENT CAUSE FOR REPLACEMENT OF THE SEAL.
 4. LOOSE STRAPS SHOULD BE CHECKED FOR DEGREE OF LOOSENESS BY POSITIONING THE HOOK OF A SCALE (COMMONLY KNOWN AS A FISH SCALE) BEHIND THE STRAPS NEAR THE MID POINT AT THE TOP OF THE UNIT LOAD. PULL THE SCALE UNTIL A READING OF 20 POUNDS IS OBTAINED. THE DISTANCE BETWEEN THE TOP PALLET ADAPTER AND THE STRAP MUST NOT EXCEED 1-1-1/2". IF MEASUREMENT EXCEEDS 1-1/2", THE STRAP MUST BE TIGHTENED OR REPLACED. SEE PAGE 6 FOR GUIDANCE. TIGHTENING CAN BE ACCOMPLISHED BY EITHER OF TWO METHODS.
 - (A) A STRAP TENSIONING TOOL CAN BE USED IF THE STRAP HAS AT LEAST A 6" LONG TAB AT THE SEAL. SEE GENERAL NOTE "L" FOR GUIDANCE.
 - (B) AN 18" OR LONGER STRAP CAN BE USED AS A SPLICE PIECE. CUT THE LOOSE STRAP ON BOTH SIDES OF THE ORIGINAL SEAL AND DISCARD THE CUT OUT SECTION OVERLAP ONE END OF THE ORIGINAL STRAPPING SO AS TO PROTRUDE SLIGHTLY BEYOND THE END OF THE SEAL TO BE USED. POSITION AND SECURE SEAL TO OVERLAPPED SECTION WITH TWO PAIR OF NOTCHES. USING A STRAPPING TOOL, TENSION AND SEAL THE LENGTHENED STRAP. THE STRAP SPLICE PIECE MAY BE CUT FROM NEW STRAP OR USED STRAP, PROVIDED IT IS AT LEAST OF AS GOOD A QUALITY AS THE STRAP TO WHICH IT IS BEING SECURED. NOTE: ONLY ONE SPLICE PER STRAP IS ALLOWED ON UNIT LOADS OF AMMUNITION.
 5. CAUTION: WHEN A STRAP IS REPLACED/SPLICED OR RETENSIONED, AND THE OTHER STRAPS ON A UNIT LOAD ARE NOT, CARE MUST BE EXERCISED TO INSURE THAT THE TENSION ON THE AFFECTED STRAP IS NEARLY THE SAME AS THAT OF THE OTHER STRAPS.
- O. OUTLOADING AND STORAGE OF PALLET UNITS OF COMPLETE ROUNDS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THE APPLICABLE PROCEDURAL DRAWINGS AS IDENTIFIED IN THE APPENDICES FOR SPECIFIC UNITS.
- P. MARKING FOR SHIPMENT AND STORAGE OF UNIT LOADS OF CYLINDRICAL CONTAINERS WILL BE ACCOMPLISHED IN ACCORDANCE WITH DAC DRAWING ACV00561. BAR CODES SHALL BE APPLIED AS SPECIFIED IN ACV00561.
- Q. IF UNITIZING OPERATIONS ARE BEING PERFORMED IN SUPPORT OF A SHIPMENT OF ITEMS FOR TROOP USE AT A CAMP, POST OR STATION, AND, IF IN ADDITION TO FULL LAYER UNITS SPECIFIED IN GENERAL NOTE "G", A FEW LOOSE CONTAINERS ARE REQUIRED TO SATISFY THE QUANTITY REQUISITIONED, THE LOOSE CONTAINERS NEED NOT BE UNITIZED. HOWEVER, THE METHOD FOR BRACING AND STAYING OF THE LOOSE CONTAINERS WITHIN THE LOAD TO BE SHIPPED MUST COMPLY WITH THE METHODS SPECIFIED WITHIN THE APPLICABLE 19-48 SERIES OUTLOADING PROCEDURAL DRAWING.
- R. DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES, AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENT MAY BE CALCULATED ON THE BASIS THAT ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454 KG.
- S. WHEN ASSEMBLING A COMPLETE PALLET UNIT, CARE SHALL BE TAKEN TO INSURE THAT THE CONTAINERS, DUNNAGE ASSEMBLIES AND INSENSITIVE MUNITIONS SEPARATORS ARE EVENLY ALIGNED SO THAT THE SIDES AND ENDS OF THE PALLET UNIT DO NOT EXCEED A 1/2" TOLERANCE, RELATIVE TO THE PALLET. SEE THE "UNIT ASSEMBLY TOLERANCE DETAILS" ON PAGE 7.
- T. DIMENSIONS GIVEN FOR DUNNAGE ASSEMBLIES WILL BE FIELD CHECKED PRIOR TO THEIR ASSEMBLY. CONTAINERS MUST FIT SNUGLY IN THE DUNNAGE ASSEMBLIES. THIS GUIDANCE MUST BE APPLIED PRIOR TO BEGINNING A PALLETIZING OPERATION. ALSO, DUE TO VARIATION OF CONTAINER DIMENSIONS, ADJUSTMENTS MAY BE REQUIRED AS TO THE LOCATION OF CERTAIN PIECES ON DUNNAGE ASSEMBLIES.
- U. ALL WOODEN DUNNAGE USED IN UNIT LOADS SHALL BE PRESERVATIVE TREATED IN ACCORDANCE WITH THE PROCEDURES SPECIFIED IN MIL-B-2427 FOR CLEATED WOODEN BOXES. IF THE DUNNAGE CONSISTS OF MORE THAN ONE COMPONENT, IT MUST BE ASSEMBLED PRIOR TO TREATMENT. THE LETTERS PA DENOTING PQ56 (COPPER-8-QUINOLINOLATE), PB DENOTING M-GARD W550 (ZINC NAPHTHANATE EMULSIFIABLE), PC DENOTING M-GARD W510 OR CUNAPSOL 5 (COPPER NAPHTHANATE) OR PE DENOTING TANALITH E OR TANALITH E 3492 (COPPER CARBONATE) MUST BE APPLIED TO THE WOOD DUNNAGE IN LETTERS AT LEAST ONE-INCH HIGH.
- V. FOR LESS-THAN-FULL-LAYER LOADS, EMPTY OR REJECT CONTAINERS PREFERABLY WILL BE USED OVER OMITTING CONTAINERS. EACH APPENDIX DRAWING WILL SPECIFY THE MAXIMUM ALLOWABLE NUMBER AND PLACEMENT OF EMPTY, REJECT, OR OMITTED CONTAINERS THAT CAN BE USED FOR APPROVED LIGHT OR PARTIAL PALLET UNITS. THE FOLLOWING PROVISIONS SET FORTH THE SPECIFICATIONS THAT MUST BE FOLLOWED WHEN EMPTY, REJECT, OR OMITTED CONTAINERS ARE USED FOR LIGHT OR PARTIAL PALLET UNITS.
1. CAUTION: EXCEEDING THE MAXIMUM NUMBER OF EMPTY, REJECT OR OMITTED CONTAINERS OR IMPROPERLY PLACING THE EMPTY, REJECT OR OMITTED CONTAINERS WITHIN THE UNIT LOAD AS SPECIFIED IN THE APPROPRIATE APPENDIX DRAWING COULD RESULT IN AN UNSAFE UNIT LOAD.
 2. EMPTY CONTAINERS WILL BE POSITIONED ON THE OUTSIDE ROWS OF THE PALLET UNIT AS DEPICTED ON PAGE 5. EMPTY OR REJECT CONTAINERS WHEN USED TO COMPLETE A LIGHT PALLET UNIT WILL BE MARKED AS SPECIFIED IN ARDEC DRAWING NO. 12982865.
 3. EACH PALLET UNIT CONTAINING EMPTY OR OMITTED CONTAINERS WILL HAVE A WEATHER RESISTANT PLACARD APPLIED TO ONE SIDE AND ONE END OF THE UNIT. THE PLACARDS WILL BE STENCILED WITH A CONTRASTING COLOR, USING LETTERS THAT ARE AS LARGE AS PRACTICAL BUT NOT LESS THAN 1/2" IN SIZE TO READ: "THIS UNIT LOAD CONTAINS-(NUMBER) EMPTY AND (NUMBER) OMITTED CONTAINER(S)."
- W. COOLER NAILS MAY BE SUBSTITUTED FOR THE COMMON NAILS WITHIN EACH APPENDIX BY APPLYING THE FOLLOWING GUIDANCE. THE NUMBER OF COOLER NAILS TO BE USED WILL BE THE NUMBER OF COMMON NAILS MULTIPLIED BY 1.2 ROUNDED UP TO THE NEXT WHOLE NUMBER, THE SIZE OF COOLER NAILS TO BE USED WILL BE THE SAME AS SPECIFIED FOR THE COMMON NAILS (4d, 6d 10d, ETC.) BUT WILL CONFORM TO THE SIZE AND WEIGHT TOLERANCES SPECIFIED WITHIN ASTM F1667 FOR COOLER NAILS.
- X. REFER TO DAC DRAWING ACV00617 FOR APPROVED SOURCES FOR SEALLESS (CLIPLESS) SEALING TOOL. THESE APPROVED SEALING TOOLS CAN BE USED IN PLACE OF SEALS CURRENTLY SPECIFIED IN THE MATERIAL SPECIFICATIONS ON PAGE 2.

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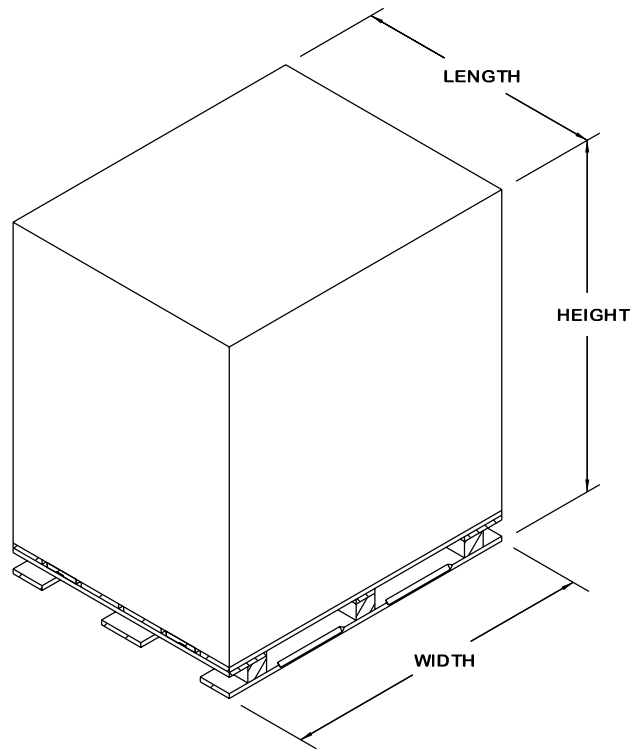
Y. TWO METHODS ARE APPROVED FOR DETERMINING THE AVERAGE WEIGHT THAT IS TO BE SHOWN ON PALLETIZED UNITS OF AMMUNITION THAT ARE BEING PRODUCED AT LOAD, ASSEMBLE AND PACK PLANTS.

1. PREFERRED METHOD FOR DETERMINATION OF UNIT LOAD WEIGHT: THE WEIGHT OF AMMUNITION UNIT LOADS MAY BE DETERMINED BY RANDOMLY SELECTING FIVE UNIT LOADS FROM THE CURRENT MONTH'S PRODUCTION. EACH UNIT LOAD SHALL THEN BE WEIGHED. THE CALCULATED AVERAGE WEIGHT OF THE FIVE UNIT LOADS (TOTAL WEIGHT OF THE FIVE UNIT LOADS DIVIDED BY FIVE) WILL BE USED AS THE UNIT LOAD WEIGHT FOR WHICHEVER IS LESS, EITHER A 60-DAY PERIOD OR UNTIL A DIMENSIONAL OR CONFIGURATION CHANGE IS MADE TO THE UNIT LOAD.
2. ALTERNATIVE METHOD FOR DETERMINATION OF UNIT LOAD WEIGHT: THE WEIGHT OF AMMUNITION UNIT LOADS MAY BE DETERMINED BY RANDOMLY SELECTING AND WEIGHING FIVE GROUPS OF UNIT LOAD COMPONENTS (PALLET, STRAPPING, SEALS, SPACER ASSEMBLIES, BATTENS, ETC.) FROM THE CURRENT MONTH'S PRODUCTION AND ADDING TO IT THE WEIGHT OF THE LOADED CONTAINERS TO BE PLACED ON THE PALLET. THE WEIGHT OF THE LOADED CONTAINERS WILL BE DETERMINED BY USING THE FOLLOWING PROCEDURES:
 - (A) WEIGH FIVE LOADED CONTAINERS INDIVIDUALLY AND RECORD THE TOTAL WEIGHT.
 - (B) WEIGH THREE INDIVIDUAL GROUPS OF FIVE LOADED CONTAINERS EACH AND RECORD EACH GROUP WEIGHT.
 - (C) WEIGH THREE INDIVIDUAL GROUPS OF TEN LOADED CONTAINERS EACH AND RECORD EACH GROUP WEIGHT.
 - (D) TOTAL ALL RECORDED WEIGHTS AND DIVIDE BY 50. THE RESULTS IS THE APPROVED LOADED CONTAINER GROSS WEIGHT.

THE APPROVED LOADED CONTAINER GROSS WEIGHT WILL THEN BE MULTIPLIED BY THE QUANTITY OF BOXES TO BE PLACED ON THE PALLET AND ADDED TO EACH GROUP OF UNIT LOAD COMPONENTS. THE CALCULATED AVERAGE WEIGHT OF THE FIVE UNIT LOAD GROUPS (TOTAL WEIGHT OF THE FIVE UNIT LOAD GROUPS DIVIDED BY FIVE) WILL BE USED AS THE UNIT LOAD WEIGHT FOR WHICHEVER IS LESS, EITHER A 60-DAY PERIOD OR UNTIL A DIMENSIONAL OR CONFIGURATION CHANGE IS MADE TO THE UNIT LOAD.

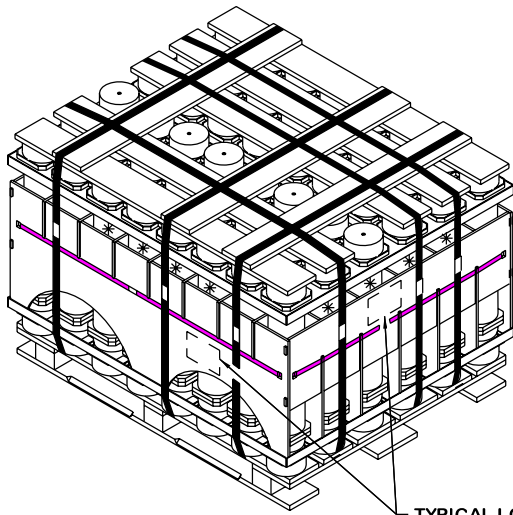
Z. ALL NON-MANUFACTURED WOOD USED IN THE PALLETIZED LOADS SHALL BE HEAT TREATED TO A CORE TEMPERATURE OF 56 DEGREES CELSIUS FOR A MINIMUM OF 30 MINUTES. THE PALLET MANUFACTURER AND THE MANUFACTURER OF WOOD TO BUILD FILLER ASSEMBLIES AND DUNNAGE ASSEMBLIES FOR THE PALLETIZED LOAD SHALL BE AFFILIATED WITH AN INSPECTION AGENCY ACCREDITED BY THE AMERICAN LUMBER STANDARDS COMMITTEE. THE PALLET MANUFACTURER AND THE MANUFACTURER OF WOOD USED TO BUILD FILLER ASSEMBLIES AND DUNNAGE ASSEMBLIES FOR THE PALLETIZED LOAD SHALL ENSURE TRACEABILITY TO THE ORIGINAL SOURCE OF HEAT TREATMENT. EACH PALLET, FILLER ASSEMBLY, OR DUNNAGE ASSEMBLY SHALL BE MARKED TO SHOW THE CONFORMANCE TO THE INTERNATIONAL PLANT PROTECTION CONVENTION STANDARD. PALLETS, FILLER ASSEMBLIES, 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 POST ON THE SAME SIDE AS THE PRESERVATIVE MARKING. THE QUALITY MARK FOR THE FILLER ASSEMBLIES AND 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.

AA. ROOFING NAILS IN ACCORDANCE WITH ASTM F1667 NL RF R-02Z MAY BE USED AS AN ALTERNATE TO STAPLES FOR SECURING STEEL STRAPS TO BOARDS. NAILS MUST BE APPLIED NEXT TO THE STRAPPING SUCH THAT THE NAIL HEADS OVERLAP THE STRAPPING. APPLY TWO NAILS IN PAIRS (TO REPLACE ONE STAPLE), ON EITHER SIDE OF THE STRAP, WITH THE SECOND NAIL APPLIED APPROXIMATELY 180 DEGREES FROM THE FIRST NAIL.



SIZE CRITERIA

MAXIMUM SIZE DIMENSIONS, SEPARATELY OR IN COMBINATION, ARE 44" LONG BY 60" WIDE BY 54" HIGH. A LENGTH NOT EXCEEDING 44" WILL PERMIT 2-WIDE LOADING IN A TACTICAL CARGO VEHICLE AND ON A CONTAINER ROLL ON/OFF PLATFORMS (CROP). A HEIGHT NOT EXCEEDING 36-7/8" WILL PERMIT A 2-HIGH STACK OF PALLET UNITS ON CROPS.



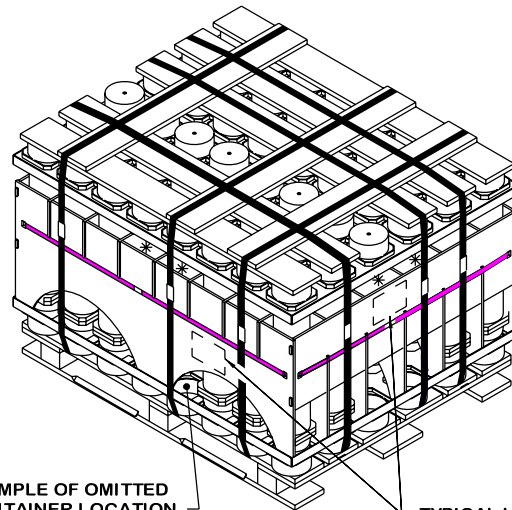
TYPICAL LOCATION OF WEATHER RESISTANT PLACARD.

NOTE: EMPTY CONTAINERS DENOTED BY A*.

LIGHT UNIT LOAD DETAIL

GUIDANCE FOR OMITTING CONTAINERS

1. NOTE: OMITTED CONTAINERS ARE ONLY TO BE USED IF EMPTY OR REJECT CONTAINERS ARE NOT AVAILABLE WHEN ASSEMBLING A LIGHT PALLET UNIT LOAD.
2. THE MAXIMUM NUMBER OF ALLOWABLE OMITTED CONTAINERS PER UNIT LOAD WILL BE SPECIFIED IN THE APPROPRIATE APPENDIX DRAWING.
3. OMITTED CONTAINERS WILL BE PLACE IN THE MIDDLE OF THE OUTSIDE ROWS ONLY. DUE TO STABILITY FACTORS FOR THESE PALLET UNITS, CONTAINERS WILL NOT BE OMITTED IN THE OUTSIDE CORNERS OF THE PALLET UNIT.
4. EACH LOAD CONTAINING ONE OR MORE EMPTY OR OMITTED CONTAINERS WILL HAVE A WEATHER RESISTANT PLACARD APPLIED TO ONE SIDE AND ONE END OF THE PALLET UNIT. THE PLACARD WILL BE STENCILED WITH A CONTRASTING COLOR, USING LETTERS THAT ARE AS LARGE AS PRACTICAL BUT NOT LESS THAN 1/2" IN SIZE, TO READ: "THIS UNIT LOAD CONTAINS __ EMPTY AND __ OMITTED CONTAINER(S)".
5. CAUTION: FAILURE TO FOLLOW THE GUIDANCE FOR THE MAXIMUM NUMBER OF OMITTED CONTAINERS ALLOWED PER UNIT LOAD OR THE LOCATION OF THE OMITTED CONTAINERS WITH IN THE UNIT LOAD AS SPECIFIED IN THE APPROPRIATE APPENDIX DRAWING COULD RESULT IN AN UNSAFE UNIT LOAD.



EXAMPLE OF OMITTED CONTAINER LOCATION.

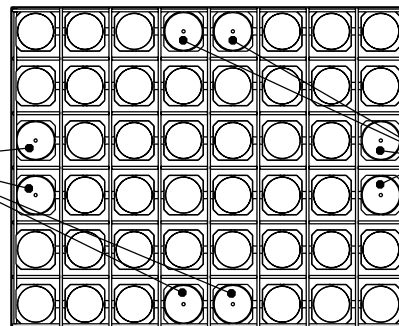
TYPICAL LOCATION OF WEATHER RESISTANT PLACARD.

NOTE: LOCATIONS OF OMITTED CONTAINERS DENOTED BY A*.

PARTIAL UNIT LOAD DETAIL

LOCATION OF THE OMITTED CONTAINERS

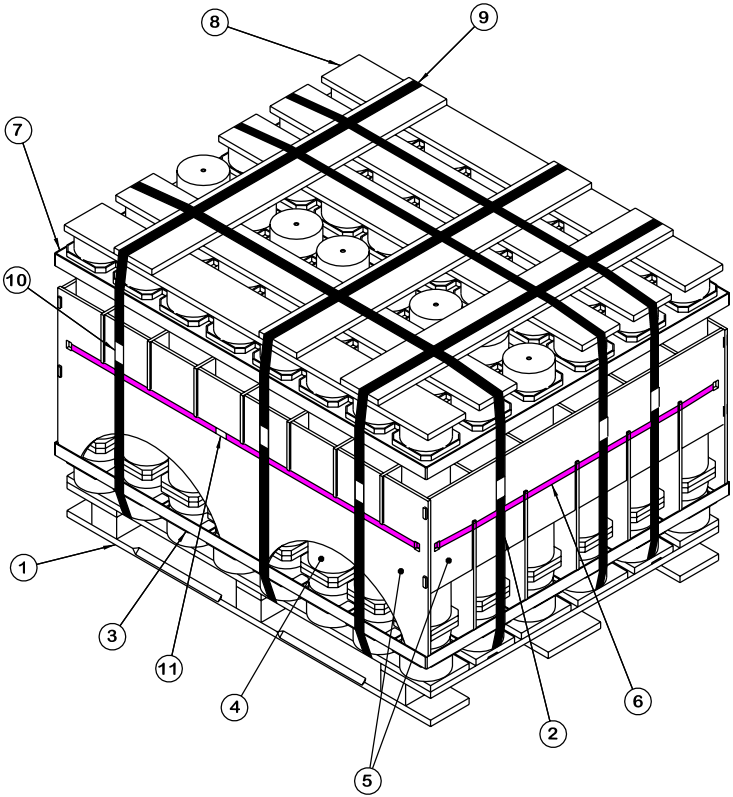
POSITION OF THE OMITTED CONTAINERS



TOP VIEW OF PARTIAL UNIT LOAD DETAIL
TOP DUNNAGE AND TOP ADAPTER REMOVED FOR CLARITY.

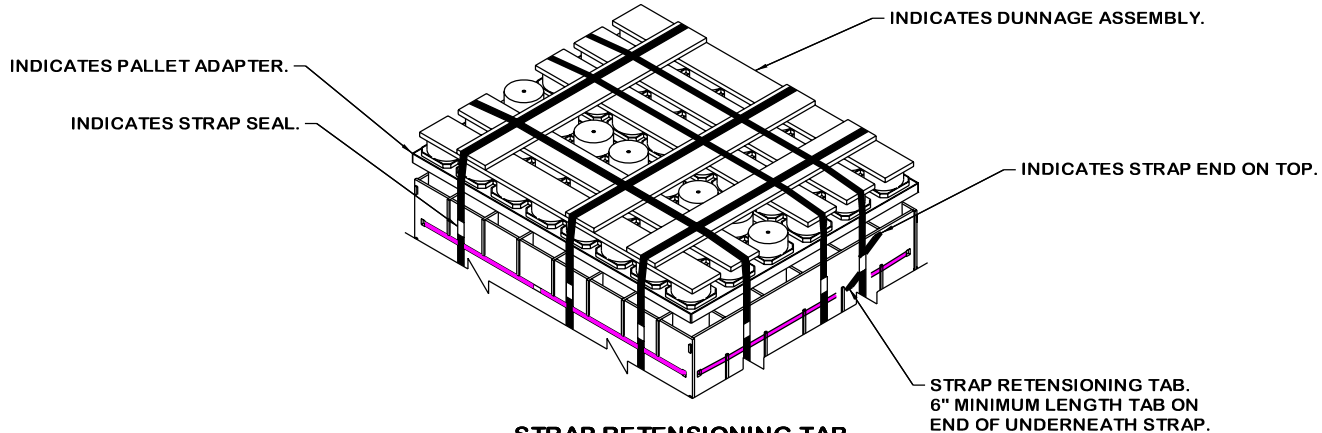
PROVISIONS FOR LESS-THAN-FULL-LAYER UNITS

TYPICAL UNITIZATION PROCEDURES



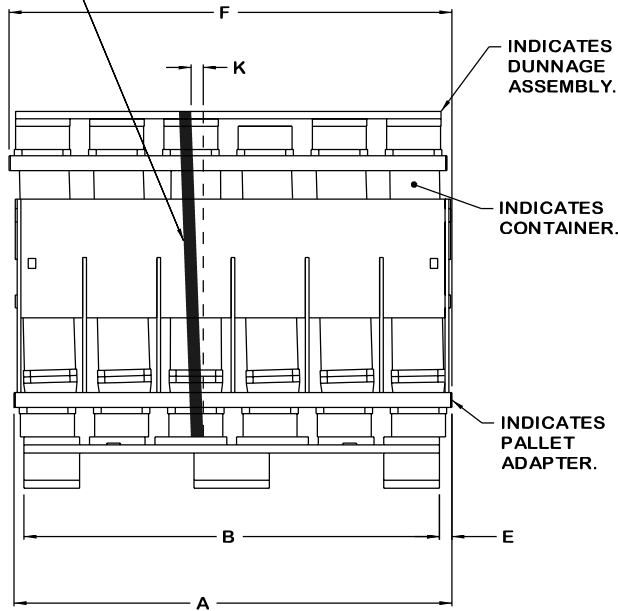
TYPICAL PALLET UNIT

- ① 4-WAY ENTRY PALLET (1 REQD). SEE GENERAL NOTE "AA" ON PAGE 4.
- ② LOAD STRAP, 1-1/4" X .035" OR .031" BY LENGTH TO SUIT STEEL STRAPPING (AS REQD). LOAD STRAPS SHALL BE FED THROUGH THE STRAP SLOTS OR PREPOSITIONED ON THE TOP DECK BOARDS OF THE PALLET PRIOR TO PLACING THE TOP ADAPTER AND CONTAINERS ON THE PALLET. SEE GENERAL NOTES "K" ON PAGE 2 AND "L", AND "M" ON PAGE 3. DO NOT TENSION AND SEAL UNTIL INSENSITIVE MUNITIONS SEPARATORS ARE SECURED TO THE UNIT LOAD.
- ③ BOTTOM PALLET ADAPTER (AS REQD). POSITION THE BOTTOM PALLET ADAPTER CENTERED ON THE TOP DECK BOARDS OF THE PALLET.
- ④ TYPICAL CONTAINER. POSITION THE CONTAINERS IN THE ORIENTATION SPECIFIED WITH IN THE APPROPRIATE APPENDIX DRAWING.
- ⑤ INSENSITIVE MUNITIONS SEPARATORS. ASSEMBLE AND SECURE THE INSENSITIVE MUNITIONS SEPARATORS AS SPECIFIED WITH IN THE APPROPRIATE APPENDIX DRAWING.
- ⑥ HORIZONTAL STRAP. 3/4" X .035" OR .031" BY LENGTH TO SUIT STEEL STRAPPING (AS REQD). APPLY HORIZONTAL STRAP TO SECURE THE INSENSITIVE MUNITIONS SEPARATORS ONLY IF REQUIRED BY THE APPROPRIATE APPENDIX DRAWING. SEE GENERAL NOTES "K", ON PAGE 2 AND "L", AND "M" ON PAGE 3.
- ⑦ TOP PALLET ADAPTER (AS REQD). POSITION THE TOP PALLET ADAPTER ON TOP OF THE CONTAINERS.
- ⑧ DUNNAGE ASSEMBLY (AS REQD). CENTER THE DUNNAGE ASSEMBLY ON TOP OF THE UNIT LOAD. SEE GENERAL NOTES "U" ON PAGE 3 AND "Z" ON PAGE 4.
- ⑨ TIEDOWN STRAP, 1-1/4" X .035" OR .031" BY LENGTH TO SUIT STEEL STRAPPING (AS REQD). INSTALL EACH STRAP TO PASS UNDER THE DECK/STRINGER BOARDS AS CLOSE TO THE PALLET POSTS AS POSSIBLE. SEE GENERAL NOTES "K" ON PAGE 2 AND "L", AND "M" ON PAGE 3.
- ⑩ SEAL FOR 1-1/4" STRAPPING (AS REQD, 1 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES. SEE GENERAL NOTE "K" ON PAGE 2.
- ⑪ SEAL FOR 3/4" STRAPPING (AS REQD, 1 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES. SEE GENERAL NOTE "K" ON PAGE 2.

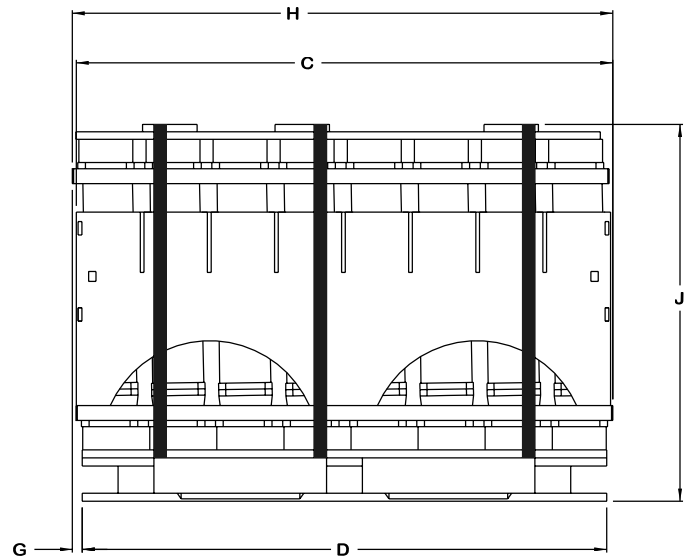


STRAP RETENSIONING TAB
(SEE GENERAL NOTE "L" ON PAGE 3.)

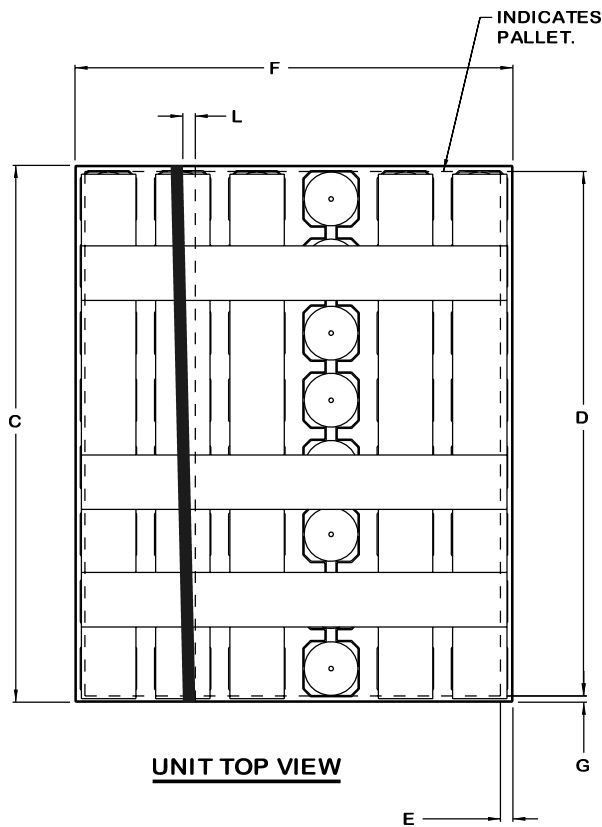
INDICATES STRAP.



UNIT LENGTH VIEW



UNIT WIDTH VIEW



UNIT TOP VIEW

SPECIAL NOTES

1. DIMENSIONS APPLICABLE TO ALLOWABLE TOLERANCES ARE EXPRESSED IN INCHES AND IDENTIFIED BY LETTERS AS FOLLOWS:

- A = UNIT LENGTH
- B = PALLET LENGTH
- C = UNIT WIDTH
- D = PALLET WIDTH
- E = (A-B)/2 WITH A PLUS OR MINUS 1/2" FOR EACH PALLET ADAPTER = LENGTHWISE OVERHANG
- F = DIMENSION "A" PLUS 1/2" MAXIMUM = ALLOWABLE UNIT LENGTH
- G = (C-D)/2; WITH A PLUS OR MINUS 1/2" TOLERANCE FOR EACH PALLET ADAPTER = WIDTHWISE OVERHANG
- H = DIMENSION "C" PLUS 1/2" MAXIMUM = ALLOWABLE UNIT WIDTH
- J = UNIT HEIGHT
- K = J/48" = MAXIMUM INCHES FROM TRUE ALIGNMENT (E. G., IF J = 36", K = 36"/48" = 3/4" MAXIMUM) = VERTICAL STRAP ALIGNMENT
- L = C/48" = MAXIMUM INCHES FROM TRUE ALIGNMENT (E. G., IF C = 48", L = 48"/48" = 1" MAXIMUM) = TRANSVERSE STRAP ALIGNMENT

2. CONTAINER, PALLET ADAPTER AND DUNNAGE ASSEMBLY ALIGNMENT TOLERANCES APPLY TO EACH ROW RELATIVE TO THE PALLET DECK. SEE GENERAL NOTES "G" AND "U" ON PAGES 2 AND 3.
3. STRAPPING TOLERANCES APPLY TO ALL STRAPS AND TO ALL SURFACES WHICH EACH STRAP ENCOMPASSES; I. E., TOP, BOTTOM AND SIDES.
4. ALTHOUGH THE DIMENSIONS APPLICABLE TO ALLOWABLE TOLERANCES SPECIFIED IN SPECIAL NOTE 1 ABOVE AND DEPICTED IN THE DETAIL ON THIS PAGE ARE FOR UNITS HAVING THE CONTAINERS UNITIZED VERTICALLY, THE GUIDANCE PROVIDED IS ALSO APPLICABLE TO UNITS HAVING THE CONTAINERS UNITIZED HORIZONTALLY.

