

UNITIZATION PROCEDURES FOR FRAGMENTATION GRENADES PACKED IN SURE-PAK CONTAINERS FOR INTRA-THEATER GROUND MOVEMENT ONLY

NOTICE: THE PROCEDURES DELINEATED IN THIS DRAWING ARE FOR INTRA-THEATER GROUND MOVEMENT ONLY.

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U.S. ARMY MATERIEL COMMAND DRAWING

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APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND SHIMP.UPTON .R.1231257183 U.S. ARMY DEFENSE AMMUNITION CENTER <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: 2017.07.13 11:11:14 -0500</small>		ENGINEERING DIVISION	FIEFFER.LAURA .A.1230375727 <small>Digitally signed by FIEFFER.LAURA.A.1230375727 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=FIEFFER.LAURA.A.1230375727 Date: 2014.10.30 06:58:19 -0500</small>		CLASS	DIVISION	DRAWING	FILE	
		TEST ENGINEER TEST REPORT	13-18D	FELICIANO.AD IN.1259200373 <small>Digitally signed by FELICIANO.ADIN.1259200373 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=FELICIANO.ADIN.1259200373 Date: 2014.11.04 09:55:11 -0600</small>		19	48	4362/4	20PM1015
		EXPLOSIVE SAFETY DIRECTORATE	CAMBRON.KIMBERLY.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: 2014.11.13 08:05:20 -0600</small>						

GENERAL NOTES

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE SPECIFIED UNITIZATION PROCEDURES ARE APPLICABLE TO LOADS OF FRAGMENTATION GRENADE LOADED IN SURE-PAK CONTAINERS. SUBSEQUENT REFERENCE TO PALLET UNIT HEREIN MEANS THE SURE-PAK WITH AMMUNITION ITEMS. **CAUTION:** REGARDLESS OF THE QUANTITY OF GRENADES TO BE SHIPPED, THE "MAXIMUM NET WEIGHT" OF THE SURE-PAK MUST NOT EXCEED 2,000 POUNDS.
- C. THE LOADS SHOWN ON PAGES 4 AND 6, AND ARE BASED ON A 48" LONG BY 40" WIDE BY 51-1/2" HIGH SURE-PAK CONTAINER WITH AN INSIDE HEIGHT OF 45", ALL WITH A MAXIMUM NET WEIGHT OF 2,000 POUNDS. ANY OF THE SURE-PAK CONTAINERS LISTED IN THE MATERIAL SPECIFICATIONS BELOW MAY BE USED, BUT MAY RESULT IN EITHER A REDUCTION IN THE QUANTITY SHIPPED OR THE USE OF MORE FILL MATERIAL TO OCCUPY THE VOID.
- D. THE FOLLOWING AMC DRAWINGS ARE APPLICABLE FOR OUTLOADING AND STORAGE OF THE ITEMS COVERED BY THIS DRAWING. THE DELINEATED PROCEDURES ARE INTENDED FOR INTRA-THEATER GROUND MOVEMENT ONLY.

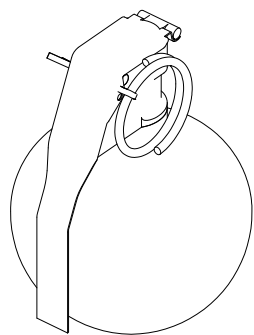
STORAGE - - - - 19-48-4118-1-2-3-4-14-22PA1002
TACTICAL VEHICLE - 19-48-4901/4-CA1702
TRUCKLOADING - - - 19-48-4117-11PA1003

- E. AMMUNITION SHOULD BE RELOADED AND TRANSPORTED IN ORIGINAL FACTORY PACKAGING WHENEVER POSSIBLE; HOWEVER, THERE ARE SITUATIONS WHEN THIS IS NOT POSSIBLE. IN ORDER TO ENSURE THE HIGHEST LEVEL OF EXPLOSIVES SAFETY PRACTICABLE, USE THE FOLLOWING PACKAGING PRIORITIES WHEN PLANNING AMMUNITION TRANSPORT. FIRST, USE FACTORY PACKAGING IF AT ALL POSSIBLE. THE SECOND OPTION IS TO LOAD FRAGMENTATION GRENADE IN EMPTY WATER BOTTLE INTO METAL CANS, AS DEPICTED ON PAGE 6 AND 7. THE THIRD AND LEAST DESIREABLE METHOD OF SECURING AMMUNITION FOR TRANSPORT IS TO USE EMPTY WATER BOTTLES TO PACK FRAGMENTATION GRENADE DIRECTLY INTO SURE-PAK CONTAINERS, AS DEPICTED ON PAGES 4 AND 5.
- F. WHEN LOADING GRENADES, THEY ARE TO BE POSITIONED SO AS TO ACHIEVE A TIGHT LOAD. THE UNBLOCKED SPACE ACROSS THE WIDTH OR LENGTH OF A SURE-PAK CONTAINER OR ANY DIMENSION IN A METAL BOX IS NOT TO EXCEED 1/2", AND UNBLOCKED SPACE IN THE HEIGHT OF THE SURE-PAK IS NOT TO EXCEED 1". EXCESSIVE SLACK CAN BE ELIMINATED FROM A LOAD BY ADDING FILLER MATERIAL SUCH AS CARDBOARD, EMPTY WATER BOTTLES, EMPTY BOXES, SHREDDED CLOTH, OR OTHER SIMILAR MATERIAL.
- G. METAL BOXES THAT MAY BE USED FOR SHIPMENT OF AMMUNITION USING THE PROCEDURES HEREIN INCLUDE M2 SERIES CONTAINER.
- H. FILLER MATERIAL IS DEFINED HEREIN AS ANY AVAILABLE MATERIAL WITH SUFFICIENT CUSHIONING TO PROTECT THE AMMUNITION ITEMS. SOME POTENTIAL SOURCES OF FILLER MATERIAL INCLUDE BUT ARE NOT LIMITED TO EMPTY WATER BOTTLES, SHREDDED UNIFORMS (CLEAN WITHOUT SHARP PROJECTIONS), DISCARDED CARDBOARD CARTONS, EGG CARTONS, WOOD SCRAPS (WITHOUT NAILS), TOILET PAPER AND PAPER TOWEL CARDBOARD TUBES, NEWSPAPER, SHREDDED COPY PAPER, AND DISCARDED BANDOLERS. **CAUTION:** ALL FILLER MATERIAL MUST BE NON-STATIC PRODUCING AND FREE FROM PROJECTIONS AND SHARP EDGES, AS WELL AS FREE FROM FOOD RESIDUE AND EXCESS WATER OR LIQUID RESIDUE.
- J. CARE SHOULD BE TAKEN WHEN LOADING SURE-PAK CONTAINERS TO ENSURE AN EVENLY BALANCED LOAD. ARRANGE THE LOAD IN SUCH A MANNER THAT THE CENTER OF GRAVITY IS CLOSE TO THE PHYSICAL CENTER OF SURE-PAK.
- K. IF SURE-PAK CONTAINERS ARE TIGHTLY PACKED AND LOADED WITH AMMUNITION ITEMS TO WITHIN 1" OF THE TOP ON THE SIDEWALLS, THE SURE-PAKS MAY BE STACKED FOR SHORT TERM STORAGE UP TO THREE HIGH. IF, HOWEVER, THE SURE-PAK CONTAINER LOAD CONSISTS OF MORE THAN ONE INCH OF FILL MATERIAL ON THE TOP OF THE LOAD, THE SURE-PAK CONTAINERS WILL NOT BE STACKED, AND SHOULD BE MARKED AS SUCH. THE ONLY EXCEPTION TO THIS REQUIREMENT IS IF THE FILL MATERIAL IS AS STRONG AS OR STRONGER THAN THE GRENADES BEING LOADED, SUCH AS THE USE OF EMPTY M2 SERIES CANS. IN THIS CASE, THE SURE-PAK CONTAINERS MAY BE STACKED AS OUTLINED ABOVE.
- L. EACH SURE-PAK CONTAINER MUST BE SECURED WITH A MINIMUM OF TWO WEB STRAPS ORIENTED AROUND THE 40" LENGTH AND THE HEIGHT OF THE LOAD. THE TWO STRAPS SHOULD BE EVENLY SPACED ACROSS THE LENGTH OF THE LOAD. CARE MUST BE TAKEN TO ENSURE THAT STRAP RATCHETS WILL NOT INTERFERE WITH EITHER STACKING OF THE SURE-PAK CONTAINERS OR LONGITUDINAL LOADING FOR TRANSPORT. IF WEB STRAPS ARE NOT AVAILABLE, SIMILAR STRENGTH PLASTIC STRAPPING IAW ASTM D3950 MAY BE USED.
- M. PORTIONS OF THE SURE-PAK CONTAINER DEPICTED WITHIN THIS DRAWING, SUCH AS THE TOP AND SIDEWALL, HAVE NOT BEEN SHOWN IN SOME LOAD VIEWS FOR CLARITY PURPOSES.
- N. THE QUANTITY OF GRENADES SHOWN IN THE LOADS HEREIN MAY BE REDUCED FOR SHIPMENT, IF DESIRED. ADDITIONAL FILL MATERIAL MUST BE INSTALLED IN ORDER TO MEET THE REQUIREMENTS IN GENERAL NOTE "F".

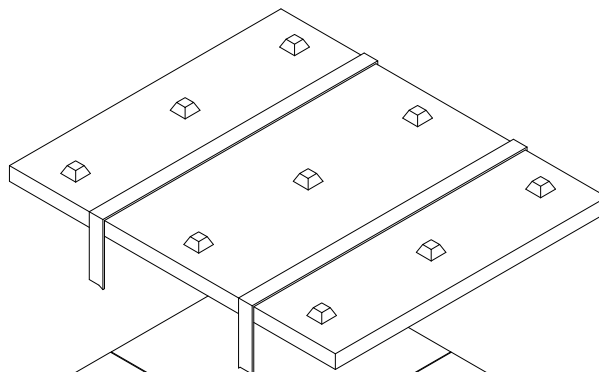
- O. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454 KG.

MATERIAL SPECIFICATIONS

<u>SURE-PAK CONTAINER</u> - - - -	SHIPPING AND STORAGE SYSTEM; SURE-PAK KIT INCLUDING TOP, BASE, SLEEVE AND 8 LOCKING CLIPS; 8115-01-556-2579 (30-1/2" HIGH), 8115-01-556-2580 (36-1/2" HIGH), OR 8115-01-556-2581 (51-1/2" HIGH).
<u>STRAPPING, WEB</u> - - - -	TIE DOWN, CARGO, VEHICLE, 2" NOMINAL STRAP, 2,000 POUND MINIMUM WORKING LOAD LIMIT, 3990-01-204-3009 OR EQUIVALENT.
<u>HARDBOARD</u> - - - -	ANSI/AHA A135.4, CLASS 1.
<u>FIBERBOARD</u> - - - -	ASTM D4727.
<u>TAPE, DUCT</u> - - - -	COMMERCIAL GRADE.
<u>HONEYCOMB FILLER</u> - - - -	FIBERBOARD, FACING PAPER WEIGHT 69 POUNDS/1,000 SQUARE FEET, SORE PAPER WEIGHT 33 POUNDS/1,000 SQUARE FEET, 1/2" CORE CELL CENTERS, INTERNATIONAL HONEYCOMB CORPORATION (OR EQUAL).
<u>FOAM CUSHIONING MATERIAL</u> - - - -	COMMERCIAL ITEM DESCRIPTION A-A-59136, CLASS 1, TYPE III, GRADE A, OR COMMERCIAL EQUIVALENT.
<u>WATER BOTTLE</u> - - - -	COMMERCIAL GRADE, 20 OUNCE OR 0.5 LITER.

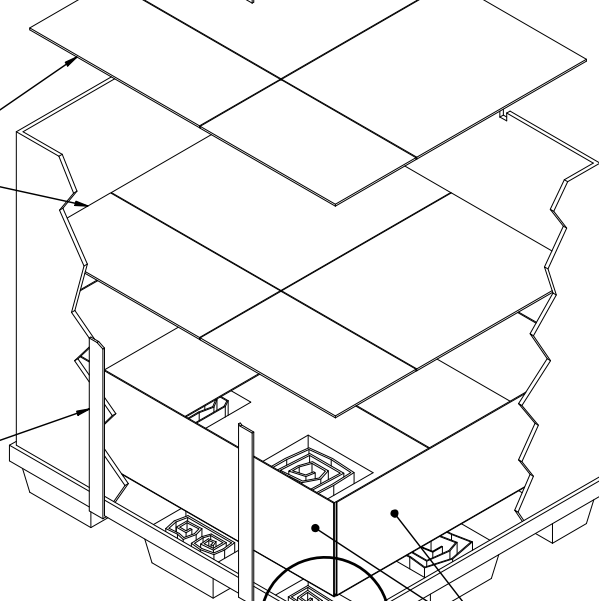


GRENADE, HAND FRAG.
DELAY; M67

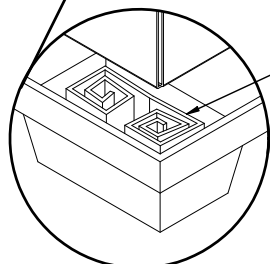


TYPICAL TOP AND BOTTOM
 FILL MATERIAL
 (CARDBOARD SHOWN).

WEB STRAP ASSEMBLY, 2" (2 REQD). INSTALL
 AS SHOWN AROUND THE SHORT DIMENSION
 OF THE SURE-PAK CONTAINER. SEE
 GENERAL NOTE "L" ON PAGE 2.



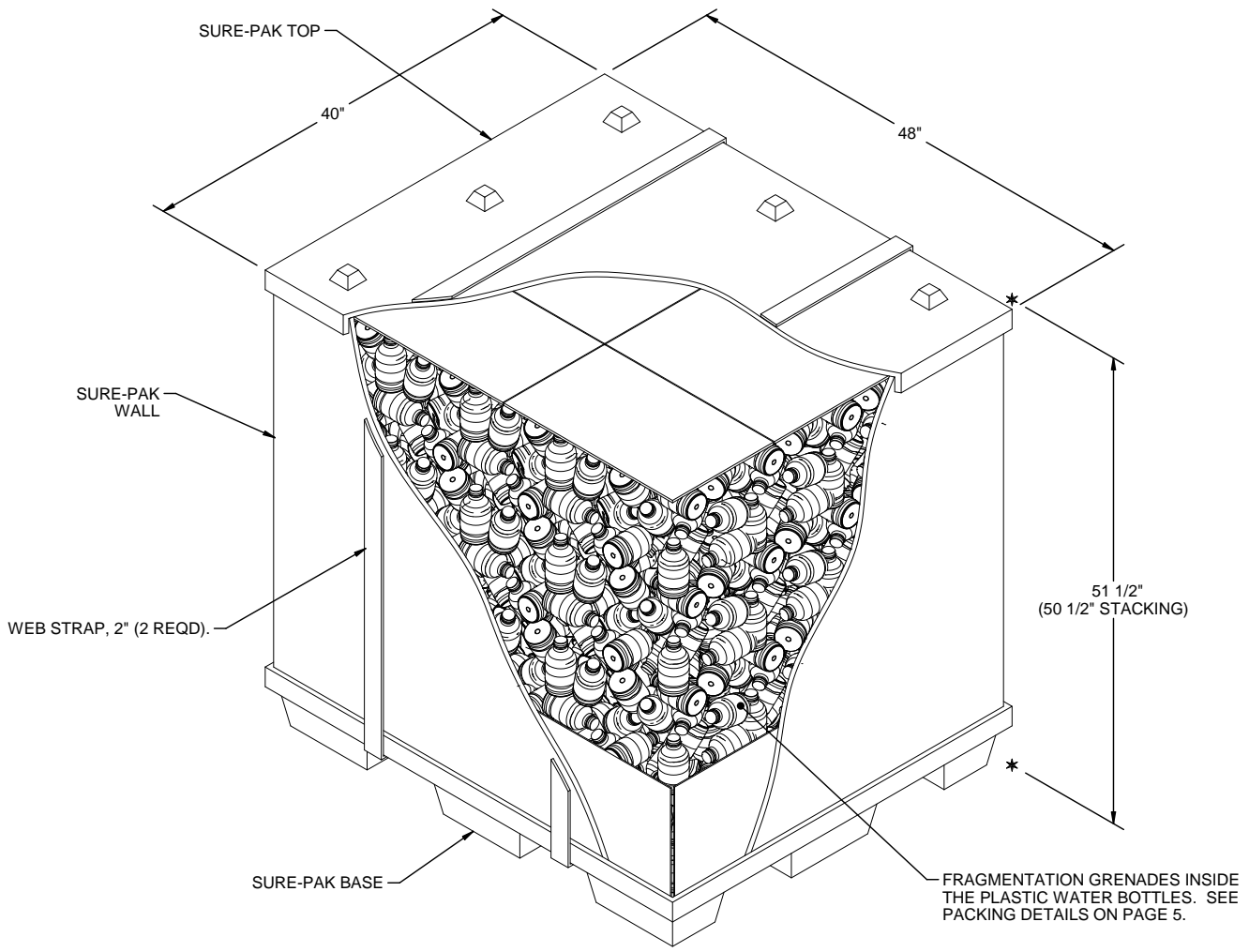
TYPICAL FILL MATERIAL
 (CARDBOARD SHOWN)



CARDBOARD SUPPORT,
 ROLLED (9 PLACES).
 SEE NOTE 2 ON
 PAGES 5 AND 7.

TYPICAL STRAPPED SURE-PAK CONTAINER

THE DETAIL ABOVE DEPICTS A SURE-PAK CONTAINER WITH
 THE MINIMUM REQUIRED FILL MATERIAL (CARDBOARD SHOWN)
 AND THE REQUIRED WEB STRAPS. THE FRAGMENTATION
 GRENADES HAVE NOT BEEN SHOWN FOR CLARITY PURPOSES.



**FRAGMENTATION GRENADE
PALLET UNIT**

SEE GENERAL NOTE "F" ON PAGE 2.

1,750 FRAG. GRENADES (MAXIMUM) @ 0.875 LB	-----	1,532 LBS
DUNNAGE	-----	42 LBS
PALLET	-----	63 LBS
<hr/>		
TOTAL WEIGHT	-----	1,637 LBS (APPROX)
CUBE	-----	57.2 CU FT (APPROX)

BILL OF MATERIAL			
SURE-PAK, 40" X 48" X 51-1/2"	-----	1 REQD	-- 63.0 LBS
EMPTY WATER BOTTLE @ 5 GRMS/BOTTLE	-----	1,750 REQD	-- 19.0 LBS
CARDBOARD	-----	AS REQD	-- 12.0 LBS
WEB STRAP ASSEMBLY, 2"	-----	2 REQD	-- 11.0 LBS

SURE-PAK CONTAINER LOADING PROCEDURES

1. SET UP THE SURE-PAK BASE AND SLEEVE, ENGAGING THE FOUR BOTTOM LOCKING DEVICES.
2. INSTALL CARDBOARD IN THE BOTTOM OF THE SURE-PAK TO FILL VOID AREAS. SEE FIGURE 8 ON PAGE 8.
3. INSTALL CARDBOARD, BENT AT 90°, AROUND THE BOTTOM INTERIOR EDGE OF THE SURE-PAK, ENSURING THAT THE CARDBOARD EXTENDS AT LEAST 8" ONTO THE SURE-PAK BASE AND 8" UP THE SURE-PAK SIDEWALL. INSTALL BOTTOM FILL MATERIAL (CARDBOARD SHOWN). SEE FIGURE 9 ON PAGE 8.
4. THERE WILL BE TWO OPTIONS TO LOAD FRAGMENTATION GRENADE INTO THE PLASTIC WATER BOTTLE.

OPTION A: APPLIES TO VARIOUS WATER BOTTLE SIZES. CUT AWAY ABOUT 1" MEASURE FROM THE BOTTOM OF WATER BOTTLE. THEN CUT THE SIDE OF BOTTLE FROM THE OPEN FACE 3" TO 3-1/2" IN DEPTH. SEE FIGURE 1 AT LEFT. LOAD FRAGMENTATION GRENADE INTO THE CUT BOTTLE WITH THE FUZE FACE UP AS SHOWN IN FIGURE 2 AT LEFT. TWIST THE CUT BOTTLE WITH FRAGMENTATION GRENADE AT THE OPEN FACE UNTIL IT IS TIGHT. SEE FIGURE 3 AT LEFT.

OPTION B: APPLIES ONLY TO 20-OZ WATER BOTTLE. CUT THE BOTTLE IN HALF ABOUT 3-1/4" MEASURE FROM THE BOTTOM OF THE BOTTLE. CUT THE SIDE OF THE BOTTOM HALF FROM THE OPEN FACE 1" TO 2" IN DEPTH. SEE FIGURES 4 AND 5 BELOW. LOAD FRAGMENTATION GRENADE INTO THE BOTTOM HALF OF THE BOTTLE WITH THE FUZE FACE UP AS SHOWN ON FIGURE 6 BELOW. INSTALL THE TOP HALF OF THE BOTTLE (WITH CAP IF POSSIBLE) OVER THE BOTTOM HALF AND TWIST DOWN UNTIL IT IS TIGHT. SEE FIGURE 7 BELOW. TAPE MAY NEED TO BE APPLIED AT A MINIMUM ONE COMPLETE LOOP AROUND TOP AND BOTTOM OF THE BOTTLE TO ENSURE A TIGHT PACK.

5. LOAD THE FRAGMENTATION GRENADE INTO SURE-PAK FROM THE BOTTOM TO THE TOP (APPROXIMATELY 1750 GRENADES)
6. DO NOT EXCEED 2,000 POUNDS GROSS WEIGHT FOR THE SURE-PAK AND CONTENTS.
7. WHEN THE SURE-PAK IS FILLED, ADD CARDBOARD OR OTHER VOID FILLER AS NEEDED TO FILL OUT THE TOP OF THE SURE-PAK. SEE GENERAL NOTE "H" ON PAGE 2.
8. INSTALL THE SURE-PAK TOP.
9. INSTALL TWO WEB STRAPS (MINIMUM) AROUND THE SHORT DIMENSION OF THE SURE-PAK. SEE PAGE 3 FOR DETAILS.

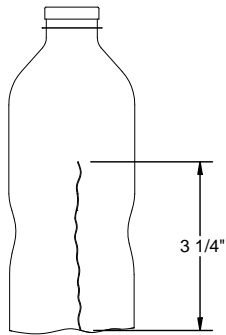


FIGURE 1

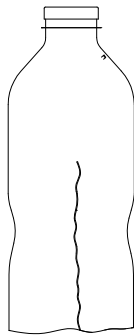


FIGURE 2



FIGURE 3

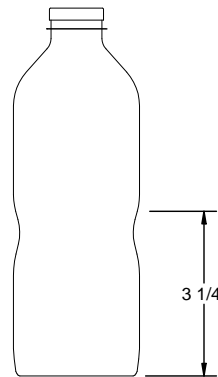


FIGURE 4

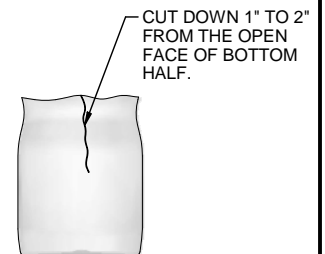


FIGURE 5



FIGURE 6

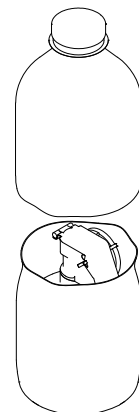
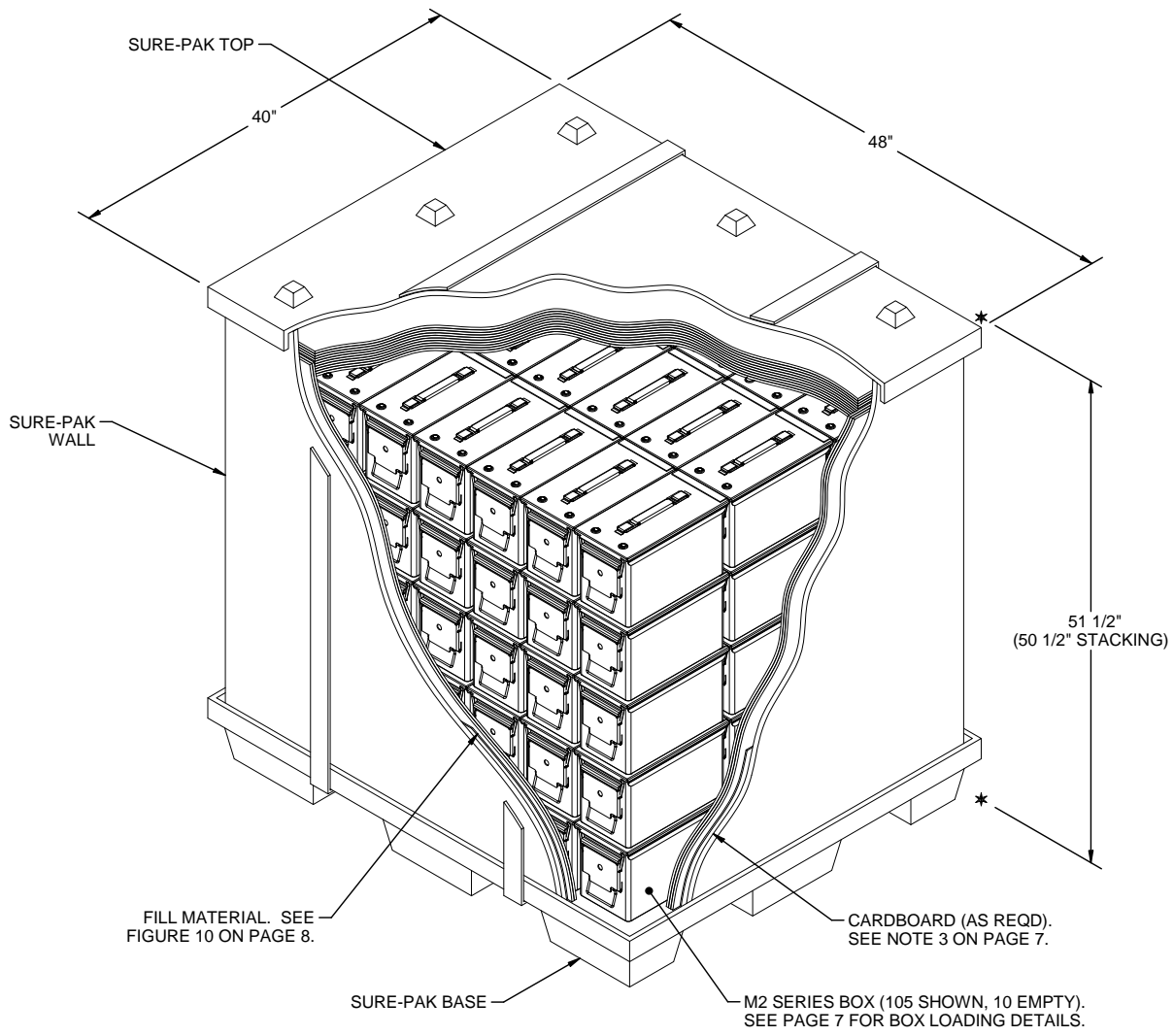


FIGURE 7



BOXED FRAGMENTATION GRENADE PALLET UNIT

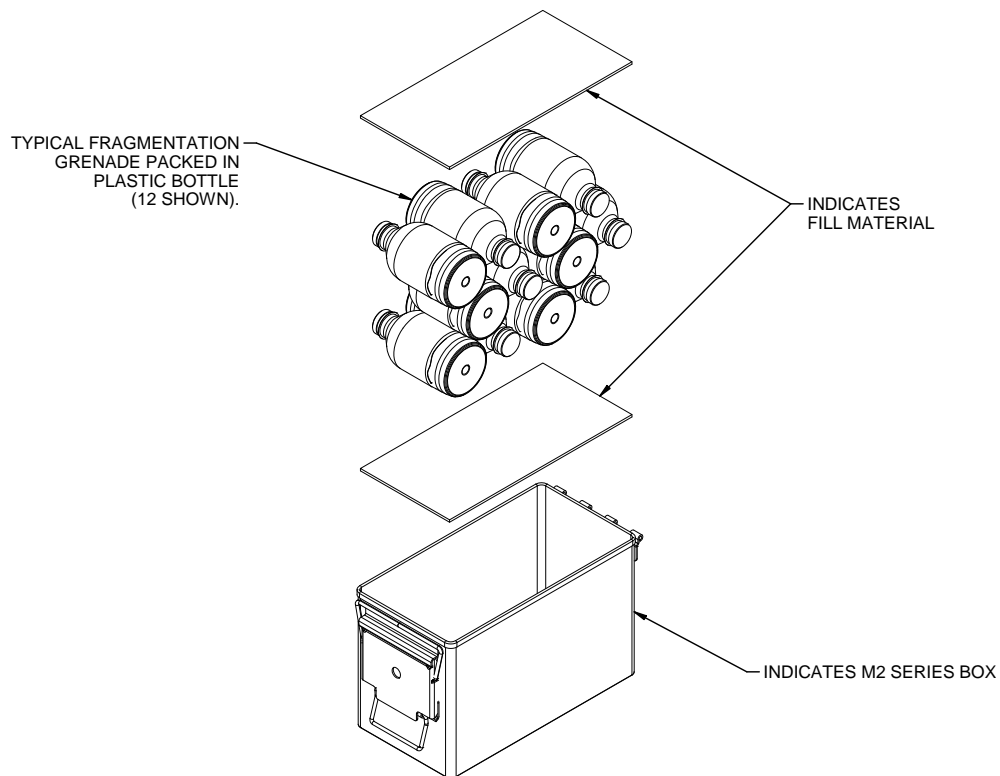
SEE GENERAL NOTE "F" ON PAGE 2.

95 M2 SERIES BOXES OF FRAG. GRENADES (12/BOX) @ 19-3/4 LBS PER BOX-	1,876 LBS
DUNNAGE	116 LBS
PALLET	63 LBS
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TOTAL WEIGHT	2,055 LBS (APPROX)
CUBE	57.2 CU FT (APPROX)

BILL OF MATERIAL			
SURE-PAK, 40" X 48" X 51-1/2"	1 REQD	63.0 LBS	
EMPTY WATER BOTTLE @ 5 GRMS/BOTTLE	1,260 REQD	14.0 LBS	
EMPTY M2 BOX	10 REQD	55.0 LBS	
CARDBOARD	AS REQD	36.0 LBS	
WEB STRAP ASSEMBLY, 2"	2 REQD	11.0 LBS	

SURE-PAK CONTAINER LOADING PROCEDURES

1. SET UP THE SURE-PAK BASE AND SLEEVE, ENGAGING THE FOUR BOTTOM LOCKING DEVICES.
2. INSTALL CARDBOARD IN THE BOTTOM OF THE SURE-PAK TO FILL VOID AREAS. SEE FIGURE 8 ON PAGE 8.
3. INSTALL CARDBOARD, BENT AT 90°, AROUND THE BOTTOM INTERIOR EDGE OF THE SURE-PAK, ENSURING THAT THE CARDBOARD EXTENDS AT LEAST 8" ONTO THE SURE-PAK BASE AND 8" UP THE SURE-PAK SIDEWALL. INSTALL BOTTOM FILL MATERIAL (CARDBOARD SHOWN). SEE FIGURE 9 ON PAGE 8.
4. LOAD M2 SERIES BOXES INTO THE SURE-PAK WITH THE HINGES FACING SAME DIRECTION. SEE THE DETAILS BELOW FOR TYPICAL LOADING OF FRAGMENTATION GRENADES INTO M2 SERIES BOXES.
5. CARDBOARD MUST BE INSTALLED AT A MINIMUM AGAINST ALL SURE-PAK SIDEWALLS AND THE BASE, TO THE HEIGHT OF THE TOP OF THE BOXES. SEE FIGURE 10 ON PAGE 8.
6. INSTALL EXTRA FILL MATERIAL AS NEEDED TO THROUGHOUT LOADING, ENSURING THAT THE SURE-PAK LOAD IS TIGHT.
7. DO NOT EXCEED 2,000 POUNDS GROSS WEIGHT FOR THE SURE-PAK AND CONTENTS.
8. WHEN THE SURE-PAK IS FILLED, ADD CARDBOARD OR OTHER VOID FILLER AS NEEDED TO FILL OUT THE TOP OF THE SURE-PAK. SEE GENERAL NOTE "H" ON PAGE 2.
9. INSTALL THE SURE-PAK TOP.
10. INSTALL TWO WEB STRAPS (MINIMUM) AROUND THE SHORT DIMENSION OF THE SURE-PAK. SEE PAGE 3 FOR DETAILS.



TYPICAL M2 SERIES BOX LOAD OF FRAGMENTATION GRENADE

BOX LID NOT SHOWN FOR CLARITY.

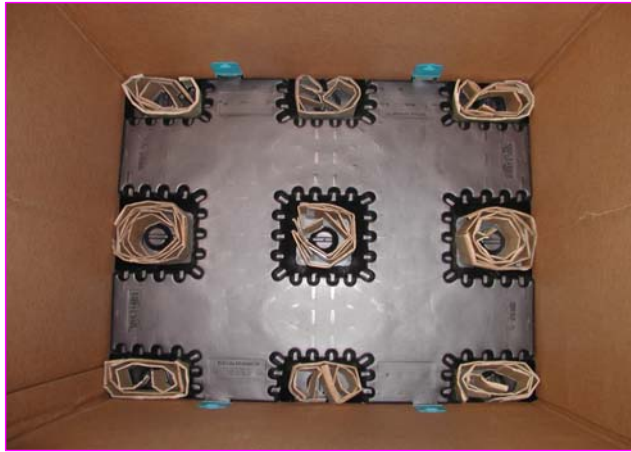


FIGURE 8



FIGURE 9



FIGURE 10