

SPECIAL PACKAGING INSTRUCTION

Form Approved -TH/TB
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 30 days per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, Va 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project(0704-0188). Washington, DC 20503. Please do not return your form to either of these addresses.

1. PART OR DRAWING NO. (CAGE) NOMENCLATURE MA318-20001(34623) TRANSFER CASE			2. CAGE 19207		3. SPI NO. AK10730056		
4. NATIONAL STOCK NO. 2520-01-073-0056			5. DATE OF DRAWING 02-05-2003		6. REVISION F		
7. QUP 001	8. ICQ NONE	9. UNIT PACK WT. 508.0	10. UNIT PACK CU (CU. FT.) 19.275		11. UNIT PACK SIZE (INCHES) 34.0 X 31.5 X X31.1		
			18. STEPS	19. REQD	20. DESCRIPTION		
12. MILITARY PRESERVATION MIL-STD-2073-1D, Method 40, & Note B			1		See Notes A – K in Block 17, Pages 1 – 7.		
13. CLEANING MIL-STD-2073-1D							
14. DRYING MIL-STD-2073-1D							
15. PACKING							
a. LEVEL A MIL-STD-2073-1D and Notes A – K							
b. LEVEL B Not Applicable							
16. MARKING MIL-STD-129 and Note I							

17. NOTES/DRAWING

A. Quality Assurance Provisions:

1. Inspect the preservation and unit pack in accordance with MIL-STD-2073-1D
2. Quality Conformance shall be in accordance with MIL-STD-2073-1D

B. The watervaporproof enclosure is provided by the closed cell polyurethane foam that totally encapsulates the item and prevents moisture from getting to the item.

C. Fill assembly to operating level with operational oil. Rotate mechanism sufficiently to assure complete coverage of all internal surfaces. Drain assembly. Assemblies filled with specified oil and operated during performance tests and evaluations need not be refilled provided it is determined internal surfaces are coated with oil. An inspection shall be made of these assemblies prior to packaging to assure they have been properly drained. Apply MIL-PRF-32033 preservative oil to all external, unpainted, unplated metallic surfaces.

D. Procedures for Foam-In-Place packaging, materials and workmanship shall be as specified herein. Reference MIL-HDBK-775, Technique VII, Full Encapsulated Pack, Design 4.

E. Step a. Select the best orientation for the item considering the ready availability of supporting surfaces, see sheet 7. The orientation selected shall also depend on locations of critical item projections and the void areas that may later cause removal of the item to be difficult, see illustration, page 7.

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17. NOTES/DRAWINGS *CONTINUED*

.Step b. For design 4, first the plywood base shall be secured to the skid. This is done by driving nails in two parallel rows, spaced alternately 3 inches apart, through the base into the skids. Also, for design 4, the top frame shall be constructed prior to securing it to the container shell. Press into position and secure to the shell using metal staples or nails in the same way that the shell is secured to the base. This must be accomplished prior to the final pour of foam

1) For securing bases and containers to skids, use pallet nails conforming to ASTM F1667, zinc coated, minimum 2.5 inches long.

(2) All wood used in type VII packs shall conform to ASTM D6199, groups II or III, class 2.

(3) All plywood bases used shall conform to A-A-55057, 5-ply, standard-interior with exterior glue, group PS-1, grades C-C. Quality shall conform to PS-1.

(4) Containers shall be fabricated from fiberboard conforming to ASTM D4727, grade V3c, type CF, class WR. Container dimensions shall be inside measurements and are cited in the sequence of length, width, and depth. The length dimensions shall be the larger of the two dimensions of the open face of the box, and the depth dimension shall, be perpendicular to the length and width, see bill of materials.

Step c. Prepare properly sized prefoamed blocks to support the item in a stable position during the foaming procedure. Blocks must be cut and positioned so that the direction of foam rise (maximum compressive strength) is supporting the item.

This is very important on heavy items to prevent blocks from collapsing. Class and grade of foam shall be identical to the foam ingredients to be used. The thickness of the blocks shall be determined by the requirement for critical centering of the item between the top and bottom of the container. Additionally, load-bearing material, plywood, is required to distribute concentrated loads over the area of the foam blocks thereby preventing compression and damage to the foam blocks prior to foaming, see sheet 7.

Step d. With the item supported on the blocks, determine the cut line in the horizontal plane that will best permit removal of the top cut section of the foamed pack and subsequent removal of the item from the remaining bottom section. The cutline shall be 16 inches from the bottom of the container base.

Step e. A protective sleeve, see sheet 6 & 7 shall be fabricated to contour to the item as closely as possible and be positioned horizontally around the item so that the cut line marking to be applied on the exterior of the container will be located at the vertical center of the sleeve. The sleeve shall be fabricated and formed using fiberboard material conforming to type CF, grade V3c, class WR, ASTM D4727. The sleeve shall be secured in place with tape conforming to ASTM D5330/D5330M and drawn tightly to the item under adequate tension. This sleeve is designed to provide protection to the item during the cutting operation when opening, and to facilitate the removal of both the top of the container and the item from the base section. Care shall be exercised to ensure that there are no projections beyond the plane formed by the sleeve.

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Step f. Two pieces of barrier material, one conforming to MIL-PRF-121, type I, grade C, class 1 and the second conforming to A-A-203, style 1, 40-pound basis weight (minimum) shall be prepared of such dimension as to completely encircle the item with sleeve attached. The first wrap, MIL-PRF-121, shall be applied with the "face" or wax-free side toward the item. Both wraps shall be applied in such a manner to conform to the contour of the item and shall not be loosely applied. Caution shall be taken to insure that no rips, tears, or holes are present in the wraps exposing any part of the item prior to application of foam. The overlaps (wrap joints) shall be rolled and pressed to ensure that the foam does not enter the wraps and contact the item. Secure and seal outer kraft wrap joints, tucks, folds, seams, etc., with A-A-883 tape, 2-inch width minimum.

Step g. The wrapped item shall have a minimum clearance of 2-1/2 inches, except on the bottom which will be 3-1/2 inches, between the container walls and the outermost projections of the wrapped item.

Step h. The amount of foam specified, 29.5 lbs., should only be used as a guide. Exact amount required is the responsibility of the packaging activity. Dispense foam into the void using successive pours, as required, ensuring that any additional pour is dispensed at the tack free point of the previous pour. The amount actually used per pack can be greatly influenced by the type of equipment used, foam formulation, atmospheric conditions, facilities, etc. Sufficient quantities of foam shall be dispensed to provide total volume fill. Furthermore, for design 4, the polyurethane foam must lay level with the top of the 2- by 2-inch top frame around the circumference of the pack to permit the plywood cover to be nailed flush to that 2- by 2-inch top frame and still meet the performance characteristics of the pack. Also, for design 4, the scored lip, 1.5-inch dimension of the shell, shall be folded over 90° onto the top frame and secured in place. Design 4 shall be closed by nailing a minimum .375-inch thick plywood cover to the top frame using box nails conforming to ASTM F1667, zinc coated, minimum of 1.25 inches long. Nailing shall not be over 4 inches apart. The plywood cover shall not be nailed to the top frame until the foam pack has been inspected for 100 percent fill and allowed to set up for a minimum of 1/2 hour. All plywood covers shall be minimum .375-inch thick and shall extend to the outer edge of the ends and sides. The plywood shall conform to PS-1 and shall be of full exterior exposure durability and a minimum grade C-C.

F. Special marking for technique VII packs.

Each design in technique VII shall include the special markings identified herein. (Special markings shall be limited to stenciling, printing, or silk screening per MIL-STD-129. Labels are not permitted for any marking other than bar coding and shipping label.) Include Reusability instructions and Opening instructions, reference MIL-HDBK-775, figure 13.

G. Reusability of technique VII packs.

- a. Reusability of technique VII packs is limited to the return of the unserviceable part.
- b. Once the pack is opened, the item is subject to environmental deterioration and should be stored indoors under controlled conditions.
- c. All technique VII packs opened for quality conformance inspection shall not be reused or repaired and shall be disposed of.

H. The rough handling tests specified in MIL-STD-2073-1 shall be required on one pack from each production run.

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I. Polyurethane Foam shall be in accordance with MIL-F-83671, Class 1, Category 2, Density 2.0 LBS/CUFT and the following:

- Tensile strength requirements shall apply.
- Moisture vapor permeability requirements shall apply.
- Oil resistance requirements shall apply.

See MIL-HDBK-775, para 5.1.7.2, Step h for discussion on amount of foam estimating.

J. The Unit Container shall be the shipping container.

K. Inspection.

- (1). Exterior appearance. When inspected, the exterior of the pack shall be free from surface distortions measuring in excess of 0.25 inch per 12 linear inches of container. Packs possessing skids or specialized bases and exceeding 150 pounds in gross weight shall be checked for base distortion while the base is resting on a flat surface. Surface distortion measurements shall not be more than 0.50 inch above the supporting surface at any point on the perimeter of the pack base. Opening and reusability instruction markings shall be as specified for the selected procedural design.
- (2). Completeness of fill. The resultant foam formed in the packs shall provide, as nearly as possible, a complete fill of the intended void space. Severe rounding off of interior container corners, excessive noncontact (bridging) over desirable item bearing surfaces, large void areas, and evidence of incomplete bonding of prefoamed materials shall not be permitted. For technique VII, foam must fill 100 percent of the container. No bridging (noncontact) over item surfaces shall be permitted. Voids or evidence of incomplete bonding shall not be permitted (see MIL-HDBK-775, appendix A, 30.5.4 and 30.5.5).
- (3). Foam adherence. There shall be no evidence of foam breakthrough or penetration or adherence either on the item, intimate wraps (except special wraps), sealed bags, inner surfaces of containers (except where foam is applied directly against container walls), or restraining bucks (see appendix A, 30.5.4 and 30.5.5).
- (4). Release of items. Items shall be easily removed from the foam with no evidence of accidental sealing between wraps, parting films, or bags. There shall be no evidence of locked items caused by improper application of multiple pours or excessive pressures created by void overfills.
- (5). The foam pack formed by a FIP technique shall be essentially homogeneous throughout with a uniform cell structure. There shall be no splits, sparklers, void openings, or pockets over 0.50 inch in any direction that might have resulted from rapid formation or release of the blowing agent before the polymer structure reached sufficient strength. There shall be no evidence of shrinkage such as would be apparent by wrinkles or indentations in the foam surface. Further, there shall be no unexpanded resin, occlusions, or foam scorching as evidenced by discoloration from the generation of excessive heat during the exothermic reaction.
- (6). The fusion line between successive pours shall be well knitted and shall show no occlusions, cracks, or separations. The foam formed shall not be soft, tacky, or brittle after curing. The individual foam chemicals are classified as toxic or hazardous in their original state and, also, when combined during the mixing process.
- (7). Safety and health considerations (occupational and environmental). All chemicals and materials required for FIP packaging shall be ordered and furnished with up-to-date material safety data sheets. For contract application, the appropriate OSHA standard shall be specified and followed. Any potential hazards resulting from the use of FIP procedures should be minimized through the use of proper preventive measures and controls.

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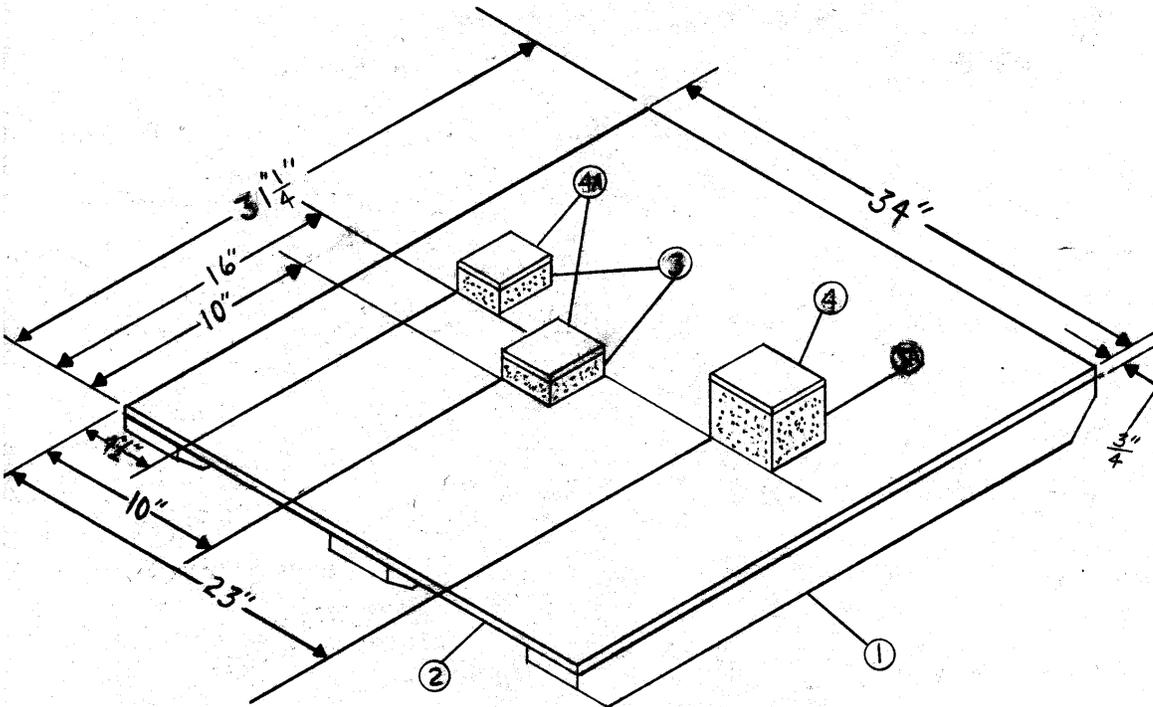
BILL OF MATERIALS

	<u>NOUN</u>	<u>SPECIFICATION</u>	<u>SIZE(inches)</u>	<u>Quantity</u>
1	Skids, Wood	ASTM D6199, Group II or III, Class 2	3 x 4(NOM) x 31-1/2	2 EA
2	Deckboard, Plywood	A-A-55057, Type A, C-C, Ext.	34 x 31-1/4 x 3/4	1 EA
3	Block, Polyurethane	MIL-F-83671, Class 1, Category 2 Density: 2 LBS/CUFT & Note J	6 x 4 x 4-1/2 A. 6 x 6 x 6	1 EA 1 EA
4	Support Plywood	A-A-55057, Type A or B	6 x 6 x 1/4 A. 6 x 4 x 1/4	1EA 1 EA
5	Sleeve	ASTM D4727, Type CF, Class WR, Grade V3c	95 X 8, see sheet 6-	1 EA
6	Tape	ASTM D5330/D5330M	1/2 inch by length as required	
7	Wrap, Protective	MIL-PRF-121, Type 1, Grade C, Class 1 96 x 36	90 x 36	1 EA
8.	Wrap, Outer	A-A-203, Style 1, 40 LB Min. Basis Wt.	90 x 36	1 EA
9.	Tape	A-A-883, Type I	2 inches by length as required	
10	Container Shell*	ASTM D4727, Type CF, Grade V3c, Class WR, see note L	SEE SHEET 6	1 EA
11	Nails, Std. Box, or Staples	ASTM F1667, Zinc Coated		
12.	Top Frame	ASTM D6199, Group II or III, Class 2	A.2 x 2(NOM) x 33-3/4 B. 2 x 2(NOM) x 23-1/8	2EA 2 EA
13.	Barrier, Polyurethane	MIL-F-83671, Class 1, Category 2, Density: 2 LBS/CUFT & Note J	40.0 LBS (estimated)	
14.	Top, Plywood	A-A-55057, Type A,C-D Ext	34-1/2 x 31-3/4 x 3/8	1 EA

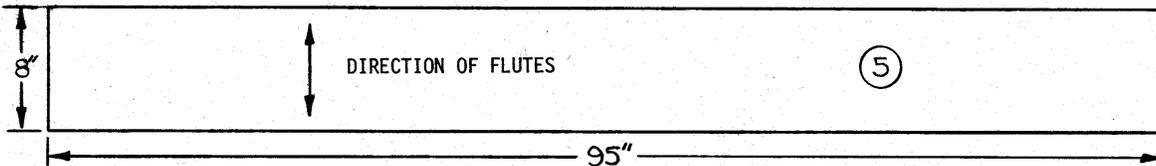
* The container shell is a modified fiberboard box, ASTM D5118, Style RSC without the bottom and top. The top shall have a 1-1/2 inch flap that shall be folded 90 degrees, see Figure 12 and 13 in MIL-HDBK-775, page 40

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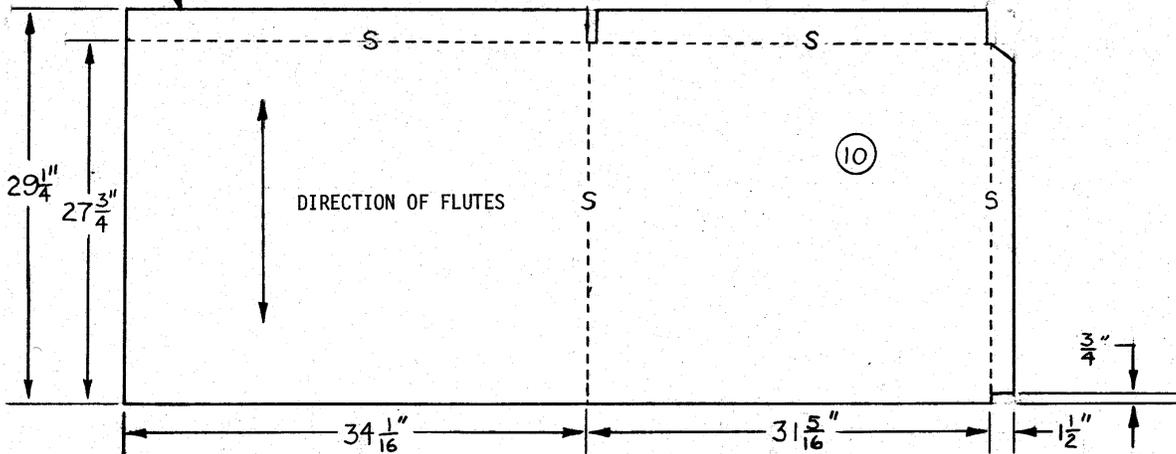


PROTECTIVE SLEEVE



NOTE: PRIOR TO ASSEMBLING THE TOP FRAME TO THE CONTAINER SHELL, THE SCORED LIP (1 1/2 INCH DIMENSION) OF THE SHELL SHALL BE FOLDED TO THE INSIDE.

CONTAINER 2 PIECES REQUIRED JOINED TOGETHER



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