CHAPTER 4

# BAGS AND SACKS

## NEED FOR BAGS AND SACKS

While a considerable amount of the materiel furnished to the military services is shipped in fiberboard, metal, or wooden containers, there are many supplies which can be most economically shipped in bulk quantities in bags and sacks. Items such as food products, building materials, some chemicals and minerals are effectively shipped in bags and sacks. Bags and sacks possess the inherent advantages of having low tare weight ratio (that is, the ratio of the weight of the container to the weight of the contents); being flexible; providing ease in filling and handling; requiring a minimum storage space; and being constructed of low cost materials.

## BAGS DEFINED

A bag is a preformed container made of flexible material, generally closed on all sides except one which forms an opening that may or may not be sealed after filling. It may be made of a single ply or multiple plies of flexible material, or a combination of two or more materials such as paper, metal foil, cellulose, and plastic films and textiles, any of which may be coated, laminated, or treated to provide the properties required for packaging, storing, and distributing the commodity.

## SACKS DEFINED

A sack often used as a synonym for a bag, generally refers to heavier duty or shipping bags. No exact line of separation can be drawn between what is referred to as heavy duty bag and shipping sack. In this section, both bags and sacks are discussed and may be employed to handle the same weights and kinds of commodities. Usually, a container designed to carry over 50 pounds is considered a shipping sack.

## SHIPPING BAGS AND SACKS

For shipping military supplies, there are four flexible containers that are approved for use by the DOD. These containers are: cotton mailing bags (A-A-2714); cushioned paper shipping sacks (A-A-160); burlap (A-A-1588); and shipping bags (A-A-881).

## COTTON MAILING BAGS (A-A-2714)

This description covers cloth mailing bags with a drawstring closure. Cotton mailing bags are intended for packaging and mailing small miscellaneous items.

### Classification

Bags shall be of the following types and sizes:

Type 1 - Regular
Type 2 - Fire Retardant

Size A - 3 inches wide X 4 inches high
Size B - 3 inches wide X 5 inches high
Size C - 4 inches wide X 9 inches high
Size D - 4-1/2 inches wide X 8 inches high
Size E - 5-1/2 inches wide X 14 inches high
Size F - 6 inches wide X 9 inches high
Size G - 6-1/2 inches wide X 10 inches high
Size H - 7-1/2 inches wide X 18 inches high
Size I - 8 inches wide X 10 inches high

## CHARACTERISTICS

### Components

Bags furnished under this description shall be made from components meeting the requirements of table 4-1.

### Construction

All seams shall be sewn with stitch type 401, seam type EFa-1 of FED-STD-751, with 4 to 6 stitches per inch. Bottom and side seams shall have a stitching margin of not less than 1/4 inch from the edge of the bag. The top seam shall have a stitching margin of not less than 3/8 inch to allow for insertion of the drawstring. A twine drawstring shall be inserted through the hem at the top of the bag so that each end of the drawstring projects not less than 2 inches from the bag. The total length of the drawstring shall be not less than twice the overall width of the bag plus an additional 6 inches. A tag, made from cloth lined paper stock and measuring 3 ± 1/16 inches by 5-1/2 ± 1/16 inches, shall be inserted into the bottom of the bag and shall be sewn in place. When the bag is turned with the seam edges inside, the tag shall extend not less than 5 inches from the bottom of the bag. The paper side of the tag shall have a hard surface suitable for pen and ink addressing.

### Dimensions

Dimensions shall be outside dimensions, expressed as overall width X overall height. The tolerance for each dimension shall be + 3/8 inches, or - 1/4 inches.

### Workmanship

The bags shall be uniformly made, neatly trimmed, free from holes, stains, tears, or other defects which may impair their serviceability or appearance. The tags shall be firmly attached.

### Packaging, Packing, and Marking

Packaging, packing, and marking shall be as specified in the contract or order.

Table 4-1

| Component | Test | Requirement | Test Method |
|---|---|---|---|
| Fabric | Breaking Force<br><br>Fabric Count<br>Surface Flammability (applies only to fabric for Type 2 bags.)<br>Specific<br>Optical Density of Smoke (Applies only to fabric for Type 2 bags.) | Warp, not less than 48 pounds. Filling, not less than 35 pounds.<br>Warp yarns, not less than 40 per inch. Filling picks, not less than 40 per inch.<br>Average flame spread index, not more than 25.<br>Average maximum specific optical density, not more than 100. | ASTM D 5304<br><br>ASTM D 3775<br><br>ASTM E 162<br>ASTM E 662 |
| Seam Thread | Breaking Force | Average breaking force, not less than 3.0 pounds | ASTM D 2256, Option A1 |
| Drawstring | Breaking Force | Average breaking force, not less than 24 pounds | ASTM D 2256, Option A1 |

## PROCUREMENT

Buyers shall specify the following:

- Type and size required;
- Preservation, packaging, packing, labeling, and marking required.
- Item Identifiers/Reference Part Number System. (For cataloging use only.)

A-A-2714 - 1 B This example describes a regular 3 inch high bag.

Size A - 3 inches wide X 4 inches high
Size B - 3 inches wide X 5 inches high
Size C - 4 inches wide X 9 inches high
Size D - 4-1/2 inches wide X 8 inches high
Size E - 5-1/2 inches wide X 14 inches high
Size F - 6 inches wide X 9 inches high
Size G - 6-1/2 inches wide X 10 inches high
Size H - 7-1/2 inches wide X 18 inches high
Size I - 8 inches wide X 10 inches high

Type 1 - Regular
Type 2 - Fire Retardant

## CUSHIONED PAPER SHIPPING SACKS (A-A-160, A-A-1588)

Cushioned paper shipping sacks are made of two sheets of kraft paper separated by an evenly distributed cushioning medium. They may be used for interior or exterior packaging where insulation, water resistance, or light cushioning effect is required for items weighing not more than 10 pounds.

## CUSHIONED WITH POST CONSUMER RECOVERED MATERIAL (A-A-160)

### CHARACTERISTICS

#### Construction

The walls of the sack shall consist of 2 layers of kraft paper with a cushioned medium such as macerated paper inserted between the layers. The outer layer of kraft paper shall be water resistant. The fabricated sacks shall pass

the water resistance test and the impact resistance test. The edge of the inside seam shall be located not more than 1 inch from the side of the sack.

**Dimensions**

Dimensions of the sacks shall be outside measurements, expressed as width by length. Dimensions shall be as specified with a tolerance of ± 1/4 inch. Sack opening shall be on the short side.

**Workmanship**

Sacks shall be uniformly constructed and free from holes, tears, cuts, splits, or other defects which might impair their usefulness.

## QUALITY ASSURANCE

**Examination of the End Item For Dimensions and Workmanship**

The sample unit shall be one sack. The Inspection Level shall be S-2 with an Acceptable Quality Level (AQL) of 2.5 percent defective in accordance with ANSI/ASQC Z1.4-1993.

**Testing of the End Item For Water Resistance and impact resistance**

The same unit shall be one sack. The Inspection Level shall be S-1 with an Acceptable Quality Level (AQL) of 2.5 percent defective in accordance with ANSI/ASQC Z1.4-1993.

**Water Resistance Test**

Two drops of water shall be placed on the outside of the sack and covered with a watchglass. The water shall remain on the outside of the sack without being absorbed for not less than 30 minutes.

**Impact Resistance Test**

Determine the cubic capacity of the sack by multiplying the three factors F1, F2, and F3, together:

Cubic capacity = F1 x F2 x F3
F1 = specified length
F2 = 90% of specified width
F3 = 10% of specified width

Fill a graduated cylinder or similar volumetric device to 75 percent of the cubic capacity of the sack with dry, unpopped, popcorn. Transfer the popcorn to the sack and seal the open end of the sack with packaging tape. Drop each sack six times from a height of 36 inches onto a hard, unyielding surface such as uncarpeted concrete. The sack shall be dropped once on each face and once on each side. If any popcorn spills from the sack, the sack does not pass the impact resistance test.

**Examination of packaging, packing and marking**

The sample unit for this examination shall be one fully prepared shipping container. The Inspection Level shall be S-2 with an Acceptable Quality Level (AQL) of 4.0 percent defective in accordance with ANSI/ASQC Z1.4-1993.

### REGULATORY REQUIREMENTS

The manufacturer/contractor shall certify that the kraft paper used to make the sacks contains not less than 5 percent post consumer recovered material. The Government reserves the right to require proof of such content prior to the first delivery and thereafter as may be provided for under the provisions of the contract. Post consumer recovered material is defined as paper, paperboard and fibrous wastes from factories, retail stores, office buildings, homes, etc., which has passed through an end use as a consumer item, including: Used corrugated boxes, old newspapers, old magazines, mixed waste paper, tabulating cards, used cordage; and all paper, paperboard, or fibrous waste collected from municipal solid waste.

### PACKAGING, PACKING AND MARKING

Packaging, packing, and marking shall be as specified in the contract or order.

## CUSHIONED WITH CLOSED CELL PLASTIC FILM (A-A-1588)

### CHARACTERISTICS

#### Construction

Sacks shall be fabricated from a composite material consisting of kraft paper bonded to closed cell plastic film cushioning material. The composite material shall have a thickness of not less than 0.131 inches. The sacks shall be fabricated so that the kraft paper forms the outside surface of the sack. The open end of the sack shall be provided with an adhesive sealing flap extending the entire width of the sack. The sealing flap shall have a strip of pressure sensitive adhesive, protected by a liner, extending across the entire width of the flap. The weight and test volume for each size sack shall be as specified in table 4-2. The fabricated sacks shall pass the impact resistance test and the creep test.

Table 4-2

| Size | Minimum inside dimensions, inches | Test load, Weight per sack, maximum | pounds |
|---|---|---|---|
| 000 | 3-3/4 x 6-1/4 | 0.44 oz. (12 g) | 0.3 |
| 0 | 5-3/4 x 8-1/4 | 0.77 oz. (22 g) | 0.8 |
| 1 | 7 x 10 | 0.99 oz. (28 g) | 1.4 |
| 2 | 8-1/4 x 10 | 1.1 oz. (31 g) | 2.0 |
| 3 | 8-1/4 x 12-1/4 | 1.4 oz. (40 g) | 2.4 |
| 4 | 9-1/4 x 12-1/4 | 1.5 oz. (43 g) | 3.0 |
| 5 | 10-1/4 x 13-3/4 | 1.9 oz. (54 g) | 4.2 |
| 6 | 12-1/4 x 16-3/4 | 2.5 oz. (71 g) | 7.2 |
| 7 | 14 x 17-3/4 | 3.0 oz. (85 g) | 10.0 |

#### Dimensions

Dimensions of the sacks shall be inside measurements, exclusive of the flap, expressed as width by length. Inside dimensions for each size, excluding the flap, shall be not less than specified in table 4-2. Sack opening shall be on the short side.

#### Workmanship

Sacks shall be uniformly constructed and free from holes, tears, cuts, splits, or other defects which might impair their usefulness.

## QUALITY ASSURANCE

### Examination of the End Item For Weight, Dimensions, and Workmanship

The sample unit shall be 1 sack. The Inspection Level shall be S-2 with an Acceptable Quality Level (AQL) of 2.5 percent defective in accordance with ANSI/ASQC Z1.4-1993.

### Testing of the End Item For Impact Resistance and Creep

The sample unit shall be 2 sacks, 1 for each test. The Inspection Level shall be S-1 with a Acceptable Quality Level (AQL) of 2.5 percent defective in accordance with ANSI/ASQC Z1.4-1993.

Impact resistance shall be verified using the test load for each size specified in from table 4-2. The test load for Sizes 000, 0, 1, 2, and 3 shall consist of dry, unpopped, popcorn. The test load for Sizes 4, 5, 6, and 7 shall consist of bond paper, writing paper, or paperback books. For each size sack, the test load shall weigh within ± 0.1 pound of the weight specified in table 4-2. The popcorn shall be placed in plastic bottles or vials which will fit in the sack being tested. The test load may be distributed among more than 1 bottle or vial. Cap the bottles or vials. The paper or paperback books may be wrapped in paper or plastic for ease of insertion and removal from the sack. Place the appropriate test loads into the sack selected for this test. Remove the liner from the flap, close and seal the sack. Drop each sack 6 times from a height of 36 inches onto a hard, unyielding surface such as uncarpeted concrete. The sack shall be dropped once on each face and once on each side. If any tears more than 1/2 inch long, extending from the exterior through to the interior of the sack, are present at the conclusion of the impact resistance test, the sack does not pass the impact resistance test.

### *Creep Test*

Four test specimens, each 3" 1/8 inches square, shall be cut from each sack selected for the creep test. Two specimens shall be cut from the front face of the sack, and 2 from the rear face of the sack. The specimens shall be evenly stacked on a piece of glass approximately 3-1/2 inches square. The bottom specimen shall be placed bubble side up, the second specimen bubble side down, the third specimen bubble side up, and the top specimen bubble side down. A second 3-1/2 inch square piece of glass shall be placed on top of the stack and a weight sufficient to exert a pressure of 1.0 " 0.1 pound per square inch on the test specimens shall be placed on the top piece of glass. After 60 " 5 minutes, the vertical distance between the glass plates shall be measured at each of the 4 corners of the stack with an instrument capable of measuring to 0.001 inch. The measurements shall be taken carefully so as not to disturb the stack. The average of these 4 measurements shall be recorded as the initial stack thickness. The initial stack thickness divided by 4 shall be recorded as the thickness of the composite material. The weight shall be kept on the stack for a total of 168 " 2 hours, then the distance between the glass plates shall be measured and averaged in the same way as was done for the initial stack thickness. This measurement shall be recorded as the final stack thickness. The final stack thickness shall be not less than 80 percent of the initial stack thickness.

Examination of packaging, packing and marking. The sample unit for this examination shall be one fully prepared shipping container. The Inspection Level shall be S-2 with an Acceptable Quality Level (AQL) of 4.0 percent defective in accordance with ANSI/ASQC Z1.4-1993.

### REGULATORY REQUIREMENTS

The manufacturer/contractor shall certify that the kraft paper used to make the sacks contains not less than 5 percent post consumer recovered material. The Government reserves the right to require proof of such content prior to the first delivery and thereafter as may be provided for under the provisions of the contract. Post consumer recovered material is defined as paper, paperboard and fibrous wastes from factories, retail stores, office buildings, homes, etc., which has passed through an end use as a consumer item, including: Used corrugated boxes, old newspapers, old magazines, mixed waste paper, tabulating cards, used cordage; and all paper, paperboard, or fibrous waste collected from municipal solid waste.

### PACKAGING, PACKING, AND MARKING

Packaging, packing, and marking shall be as specified in the contract or order.

### PROCUREMENT

Buyer shall specify:

- Size, as listed in table 4-2.
- Packaging, packing, and marking required.

## BURLAP SHIPPING BAGS (A-A-881)

This description covers standard new or used burlap bags for use in domestic and overseas shipment of supplies and materials.

### CHARACTERISTICS

#### Cloth

The bags shall be fabricated from jute burlap cloth conforming to the requirements in table 4-3.

#### Construction

Bags shall be furnished new or used, as specified.

The bags shall have open-mouth tops and shall have bottom and/or side seams. The minimum average number of stitches shall be 3.0 to the inch, machine sewn and of stitch type 301 or 401 of Fed. Std. No. 751. The raw edges of the bag shall be sewn with export seams, such as those in Fed. Std. No. 751, SSd-1. Seams shall have a breaking load of not less than 80 percent of the breaking load of the burlap from which the bags are made. Raw top edges of bags shall be hemmed. Selvaged edges shall be sewn with flat seams, and raw edges with export seams.

The size or capacity of the bags shall be as specified in the contract order. When specified, bags shall be suitable for subsistence items. Each bag shall be furnished with a polyethylene liner inserted. The liner shall have a Water Vapor Transmission Rate of now more than 15g per $m^2$ per day. The liner shall extend not less than 3 inches beyond the top of the burlap.

Table 4-3

| | Fabric Count Minimum | Yarns per inch Maximum | Weight, per linear yard by 40 inch width (+8, -2 percent) |
|---|---|---|---|
| Warp | 8 | 11 | |
| Filling | 8 | 11 | 7.5 ounces |

**Workmanship**

Bags shall be clean, dry, and free of holes, tears, frayed threads, objectionable odors, or foreign matter impregnated in or adhering to the sides of the bags. The bags shall be free from other defects which may affect serviceability. If mended, there shall be no more than two mends per bag, and the maximum size of each mend shall not be more than 2 inches.

## QUALITY ASSURANCE

**Testing of Burlap Cloth**

The burlap cloth shall be tested in accordance with the methods listed below. The sample unit shall be one roll of cloth. The Inspection Level shall be S-2 with an Acceptable Quality Level (AQL) of 2.5 percent defective in accordance with ANSI/ASQC Z1.4-1993.

| TESTS | METHODS |
|---|---|
| Fabric Count | ASTM D 3775 |
| Weight | ASTM D 3776 |
| Breaking Load | ASTM D 1682 (Grab Test) |

**Testing of Polyethylene**

The polyethylene shall be tested in accordance with ASTM Method F 372, Water Vapor Transmission Rate. The sample unit shall be one roll of polyethylene. The Inspection Level shall be S-2 with an Acceptable Quality Level (AQL) of 2.5 percent defective in accordance with ANSI/ASQC Z1.4-1993.

Examination of the end item for defects in workmanship, size, or capacity. The sample unit shall be one bag. The Inspection Level shall be S-2 with an Acceptable Quality Level (AQL) of 2.5 percent defective in accordance with ANSI/ASQC Z1.4-1993.

**Testing of the End Item For Seam Strength**

The sample unit shall be one bag. The Inspection Level shall be S-1 with an Acceptable Quality Level (AQL) of 2.5 percent defective in accordance with ANSI/ASQC Z1.4-1993. Each seam of the sample unit shall be tested in accordance with ASTM Standard Test Method D 1682, Grab Test. The test specimens shall be cut so that the seam to be tested is in the middle of the specimen, parallel to the 4 inch sides. One determination shall be made on each seam of the sample unit. Breaks in the fabric outside the seam area, including jaw breaks, are acceptable provided they yield breaking loads in excess of 80 percent of the breaking load of the burlap. Any seam which has a breaking load less than 80 percent of the breaking load of the burlap from which the bags are made is a defect.

**Examination of Packaging, Packing and Marking**

The sample unit for this examination shall be one fully prepared shipping container. The Inspection Level shall be S-2 with an Acceptable Quality Level (AQL) of 4.0 percent defective in accordance with ANSI/ASQC Z1.4-1993.

**REGULATORY REQUIREMENTS**

The manufacturer/contractor is encouraged to use recovered material in accordance with Public Law 94-580 to the maximum extent practicable.

**PACKAGING, PACKING AND MARKING**

Packaging, packing, and marking shall be as specified in the contract or order.