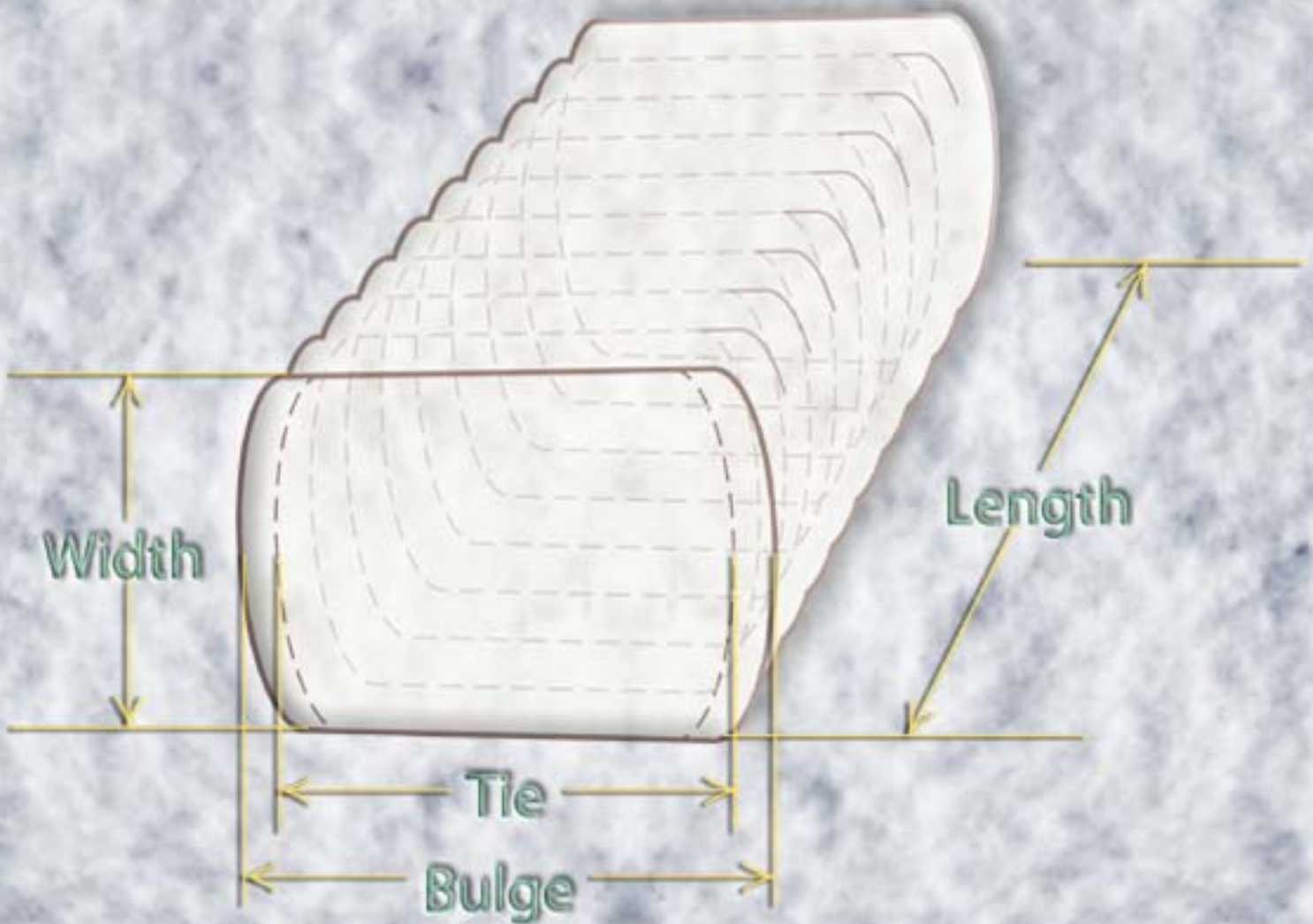
# 2005 Specifications for Cotton Bale Packaging Materials




Joint Cotton Industry Bale Packaging Committee

June 20, 2005

# 2005 SPECIFICATIONS FOR COTTON BALE PACKAGING MATERIALS

# JOINT COTTON INDUSTRY BALE PACKAGING COMMITTEE

## Preface

These specifications for cotton bale packaging materials are approved by the Joint Cotton Industry Bale Packaging Committee (JCIBPC) for 2005-crop cotton and are intended for use as manufacturing guidelines. These specifications are designed to improve the quality and protection of the cotton bale and to improve the appearance and marketability of the American cotton bale in domestic and foreign markets. Improper or careless handling, storage and transportation may result in damage to packaging materials.

All bales of cotton packaged and identified in accordance with the testing programs of the JCIBPC are exempt from these provisions.

The JCIBPC, formed in 1968 at the suggestion of the National Cotton Council of America (NCC) and the American Textile Manufacturers Institute (ATMI), is composed of two segments. One represents raw cotton (producers, ginners, warehousemen, merchants, and cooperatives) and the other represents textile manufacturers. The Chairman of the NCC appoints raw cotton committee members after consultation with the Council's certified interest organizations. Starting in 2005 the cotton committee of the National Council of Textile Organizations, succeeded ATMI as the primary group responsible for textile manufacturer committee member appointments and the NCC reserved the right to appoint additional textile manufacturer committee members. The approval, rejection or modification of materials used for cotton bale wrapping requires a majority vote from each of the committee segments. These decisions are based on extensive testing in both the laboratory and the field for at least two years.

## Summary of 2005 Meeting

The JCIBPC met March 31, 2005, in Memphis, TN, to develop 2005 Specifications. The specifications for 2005-crop cotton bale packaging materials are identical to the specifications for 2004-crop cotton bale packaging materials except for the modifications noted below:

The minimum finished bag length for woven polypropylene "Fully-Coated Gussetted Spiral Sewn Bags Used to Wrap Gin Standard and Gin Universal Density Bales" was shortened from 90 inches to 85 inches in section 2.2.4.7.3.

The minimum finished bag length for woven polyethylene "Fully-Coated Gussetted Spiral Sewn Bags Used to Wrap Gin Standard and Gin Universal Density Bales" was shortened from 90 inches to 85 inches in section 2.2.5.5.3.

**Clarification** – As noted above references to bag size requirements for spiral sewn woven polyolefin bags are found in sections 2.2.4.7.3. and 2.2.5.5.3 of these specifications. Similar references to bag size requirements are included in the specifications for burlap, cotton, polyethylene film and extruded seam woven polypropylene bags. All bags must be of sufficient length to allow the gin or warehouse to satisfactorily close and secure all bale heads regardless of the stated minimum length for any packaging material. All bags, including spiral sewn woven polyolefin bags, must be tailored to bale sizes; therefore properly sizing bags may require modifications that are based on bale dimensions found at certain locations. The revised minimum bag length does not change the requirement that cotton bale bags must provide sufficient material to fully cover all bale surfaces. None of these requirements are modified. The committee acknowledges the efforts of bag manufactures to provide packaging materials that meet these and other cotton industry specifications.

These modifications were reviewed and adopted by the JCIBPC's Specification's Review Committee.

**Carryover** -- Except as provided above, bale packaging materials carried over from 2004, which were eligible for packaging 2004-crop cotton may be used to package 2005-crop cotton.

## Additional Information

These specifications are arranged in two major sections: bale ties and bagging. Each of these sections is further divided into General Requirements and Approved Materials. Specifications for each approved material may be found by using the table of contents.

In addition, test methods applicable to each material are included within each material section. Also included are references to the various test procedures listed below:

ASTM A510
ASTM A938
ASTM D1709 Method A, aluminum
ASTM D374
ASTM D737
ASTM D751
ASTM D882
ASTM D1776
ASTM D1894
ASTM D2594E
ASTM D3218
ASTM D1922
ASTM D3950
ASTM D3887
ASTM G155

Federal Test Method-Standard No. 191A methods 5041, 5100 and 5804.

ASTM (American Society for Testing and Materials International) procedures may be obtained by contacting: ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959; Phone: (610) 832-2959; website: www.astm.org

Federal Test Methods may be obtained by contacting: General Services Administration, Specifications Unit (WFSIS), Room 6039, 7th and D Streets, SW, Washington, D.C. 20407

For further information concerning these specifications contact: JCIBPC, PO Box 820285, Memphis, TN 38182, (901) 274-9030, fax (901) 725-0510.

## Definitions

These definitions apply only for use with these specifications.

**Bale Density:** A unit of measurement of weight per unit volume normally expressed as pounds per cubic foot. Density is calculated by dividing the net bale weight by the bale volume in cubic feet. Volume is deter-mined by multiplying bale length, width and thickness dimensions expressed in feet. Thickness is determined by measuring from tie to tie across the crown of the bale.

**Universal Density (UD):** Cotton bale density of at least 28 pounds per cubic foot.

**Gin UD:** Bale compressed at the gin to a density of at least 28 pounds per cubic foot. (Bale must be tied with strapping or wire as defined under Section 1.1 and 1.2).

**Compress UD:** Flat/modified flat bale recompressed at warehouse to a density of at least 28 pounds per cubic foot.

**Standard Density (SD):** Cotton bale density of at least 23 pounds per cubic foot but less than 28 pounds per cubic foot. (Bales must be tied with strapping or wire as defined under Section 1.1 and 1.2).

**Gin SD:** Bale compressed at the gin to a density of at least 23 pounds per cubic foot but less than 28 pounds per cubic foot.

**Compress SD:** Flat/modified flat bale re-compressed at warehouse to a density of at least 23 pounds per cubic foot but less than 28 pounds per cubic foot.

**Flat/Modified Flat:** Cotton bale density of less than 23 pounds per cubic foot with flat bale density normally at 12 pounds per cubic foot and modified flat bale density at 14 pounds per cubic foot. Unless otherwise noted, reference to flat bales in specifications also includes modified flat bales.

**Panel:** Rectangular sheet of fabric; refers to top sheet in bag and panel combination of new jute, cotton, or woven polypropylene for use on gin universal or gin standard density bales.

**Spiral-Sewn Bag:** Sewn bag from burlap, cotton or polypropylene. Fabric is sewn on a bias resulting in a tube with the seam spiraling around the bale circumference. After application, bale ties are under bagging.

**Gussetted Bag:** Sewn bag from polypropylene. Fabric is seamed resulting in a tube with the seam running parallel to the edges of the tube. Opposite edges of the tube are folded inwardly to form two V-shaped sections between the front and back faces of the tube. The bottom seam of the bag is sewn through 4 layers of fabric in the gusset areas. The gussets create a rectangular-shaped mouth for filling and a rectangular bottom in the filled bag. After application, bale ties are under bagging.

**Bag and Panel Combination:** Bale cover fabrication applied on the gin press and used in combination with a top panel. After application, bagging is under bale ties.

**Wire:** Slender metal rods of round, ovalized or waisted cross section applied to restrain cotton bales after compression.

**Wire Gauge:** Unless stated otherwise, wire gauge nomenclature is consistent with ASTM A 510 or US Steel Wire Gage System (USSWG) as referenced by American Institute of Steel Construction.

**Round Wire:** Steel material having a circular cross-sectional area applied to restrain cotton bales after compression.

**Ovalized Wire:** Steel material having a cross section slightly modified from a circular cross section applied to restrain cotton bales after compression. There is no significant difference (minus 5% tolerance) in cross-sectional areas between round wire and ovalized wire. The linear densities (weight per foot of wire) of ovalized and round wires are equal.

**Waisted Wire:** Steel material having a reduced cross-sectional area between the joint portions and a non-reduced, round cross section in the portion that the joints are formed. The linear density of waisted wire is lower than that of round wire.

**Recessed Wire:** Bale tie recesses describe grooves, indentions or notches created in the flat or "hard" sides of the cotton bale, located such that when bale tie materials are applied, ties (wires or bands) lie within the depth of the recess; recesses are sufficiently deep so that ties are protected from normal handling impacts with floors, lift truck handling devices and other bales; in addition to minimizing handling stresses on bale ties, recesses are intended to reduce tearing and cutting of bagging normally associated with shearing action of ties on bagging; exact width and depth dimensions are not specified, except that grooves should be sufficiently wide to accommodate the width of band or wire tie and sufficiently deep so that the tie does not extend beyond the outside plane of the bale surface.

**Strapping:** High tensile steel or polyester material having a flattened, rectangular cross section applied to restrain cotton bales after compression.

**Slip-Seal:** One type of strapping connection to secure strap ends together. Seal has heavy indentions across width of strap. Connection allows for limited movement or slippage of bottom strap. For use with 3/4-inch x 0.025-inch strap in either a 6-band or 8-band configuration.

**Fixed-Seal:** Strapping connection in which relative movement of strap ends cannot occur. Refers to triple notch seals.

**Triple-Notch:** One type of fixed-seal strapping connection in which strap ends are secured by indenting and locking a metal seal around strap ends. For use with 3/4-inch x 0.031-inch strapping in an 8-band configuration only.

**Importer:** Person or persons in United States who clear product through U.S. Customs Service.

**NAFTA Country:** Country included in North American Free Trade Agreement which currently includes the United States, Canada and Mexico.

## Recommended Patching Materials

The Joint Cotton Industry Bale Packaging Committee develops bale packaging material specifications, which USDA adopts as a requirement for loan eligibility. Part of the Specifications since 1991 under Section 2.1 General Requirements has been a clause covering the patching of bagging cut to obtain samples. Parties responsible for sample holes must insure the bale is merchantable prior to shipment from the warehouse. In addition, bale heads and all large holes or tears must be fully covered. Bales must be cleaned prior to patching to prevent contamination. Small areas of exposed cotton due to normal wear and tear must be clean. Bales must be patched using a material that will prevent contamination concerns while adequately protecting the cotton lint inside the bale.

Whenever possible take samples prior to packaging to prevent bagging cuts. Samples can be cut inside the gin press box using "cookie cutters" attached to the platens. The cut sample can then be pulled after the bale is ejected from the bale press box but before the bale is packaged.

Following is a list of some current patching materials and techniques. This information is intended to help gins, warehouses, and textile mills identify types of patching materials. Current packaging suppliers can provide more information regarding available materials.

**Polyethylene Stretch Film:** This product's characteristics are similar to "cling type" wraps. Stretch film with a minimum thickness of 90 and 120 gauge is recommended. Stretch film must be applied under tension to assure success.

**Patching Procedure:** Stretch film patches require the use of either a hand held or a mechanical applicator. A minimum of two but preferably four continuous overlapping wraps around the bale should be made. When wrapping the bale, the applicator must maintain sufficient tension on the stretch film so that the film adheres to the bale and to itself.

**Polyethylene or Polypropylene Stretch Band, Tube, or Sleeve:** Sleeve type patches work best on bales of uniform dimensions such as gin universal density bales. In order to patch a bale the sleeve's circumference must be slightly smaller than the bale's circumference. Sleeves are typically 18 inches wide with a recommended minimum thickness of 4 mils. Sleeve size and chemistry are important factors that keep the sleeve on the bale. The sleeve circumference must be slightly smaller than the bale circumference.

**Patching Procedure:** A plastic sleeve is slipped over the end of the bale covering the area needing patching. Due to the patching materials' lack of elasticity, the sleeve application requires at least two persons or a bale stuffer. To manually apply a sleeve, securely grasp it and pull it over the head of the bale. A bale stuffer applies the sleeve on the bale using the following procedure. Mount the sleeve on the stuffer. As the bale is pushed through the stuffer the sleeve is spread enough to allow it to slide off the stuffer and on the bale.

**Tapes:** Either adhesive-backed film or woven tapes can be used to patch holes and torn bagging. Speed of application depends on tape width and the size of the hole. The adhesives must stick to burlap, cotton, polypropylene, or polyethylene bagging. Expect a small amount of cotton to cling to the tape and to be discarded when the bagging is removed.

**Patching Procedure:** Use hand held or mechanical applicators to apply tapes. Before patching, inspect the bagging around the exposed cotton. Make sure that bagging is clean and sound. Insure good bonding by pressing the tape firmly to bagging around the exposed cotton.

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## 1. SPECIFICATIONS FOR BALE TIES

### 1.1. General Requirements

**1.1.1. Length:**

**1.1.1.1. Flat Bales:** Bale ties used on flat bales shall not exceed 10 feet, 3 inches in length, excluding overlap.

**1.1.1.2. Gin Universal Density Bales:** Bale ties used on gin universal density bales pressed in a 20-21 inch wide by 54-55 inch long press box shall be 87 to 89 inches in length, unless otherwise specified in Section 1.2.[1]

**1.1.1.3. Gin Standard Density Bales:** Bale ties used on gin standard density bales pressed in a 20-21 inch wide by 54-55 inch long press box shall be 90-93 inches in length, unless otherwise specified in Section 1.2.[1]

**1.1.1.4. Length Measurement:** Length of wire ties as specified in Section 1.1.1 are measured after loops are formed from end to end excluding overlap, as indicated in the figure below.

**1.1.2. Rust Inhibitor:** All ties and fasteners must be coated or furnished with a rust inhibitor.

**1.1.3. Number of Ties Required:**

**1.1.3.1. Flat or modified flat density bales** (bales having densities of less than 23 pounds per cubic foot) must have not less than 6 ties.

**1.1.3.2. Standard density bales** must have not less than 8 ties, except that bales tied with controlled slip steel strap connections, PET plastic strap, 0.135-inch diameter galvanized wire with a twist connection, 0.148-inch or 0.162-inch diameter wire with a fabricated interlocking connection must have not less than 6 ties.

**1.1.3.3. Universal density bales** must have not less than 8 ties, except that bales tied with controlled slip steel strap connections, PET plastic strap, 0.135-inch diameter galvanized wire with a twist connection, 0.148-inch or 0.162-inch diameter wire with a fabricated interlocking connection must have not less than 6 ties.

**1.1.4. Flat Bales Packaged with Non-Reusable Ties:** Except for bales stored in the states of Alabama, Florida, Georgia, North Carolina, South Carolina, and Virginia, if the ties on a bale are not suitable for reuse when the bale is compressed, the ties will not be deemed to meet these specifications unless the producer has prepaid any warehouse charge for furnishing new bale ties. If the bale is stored at a warehouse not having compress facilities and bales shipped from the warehouse are normally compressed in transit, the warehouse receipt must show that the bale ties are not suitable for reuse when the bale is compressed and charges will be assessed by the nearest compress in line of transit for furnishing new bale ties.

### 1.2. Approved Materials

**1.2.1. Cold Rolled High Tensile Steel Strapping:** The suppliers' name or trademark must be printed or embossed on every 36 inches of strapping.

**1.2.1.1. For Use on Flat Bales and Standard Density and Universal Density Bales Compressed at a Warehouse:** The strapping shall have a minimum width of 0.75 inch, minimum thickness of 0.025 inch minimum weight of 1 pound per 15.7 linear feet of strapping, and a minimum breaking strength of 2,400 pounds with a joint strength of not less than 2,040 pounds.

**1.2.1.2. For Use on Gin Standard Density and Gin Universal Density Bales:**

**1.2.1.2.1. Fixed-Seal (Triple Notch) Connection:** The strapping shall have a minimum width of 0.75 inch, minimum thickness of 0.031 inch, minimum weight of 1 pound per 12.7 linear feet of strapping and minimum breaking strength of 3,200 pounds with a joint strength not less than 2,720 pounds for gin standard density bales or 4,000 pounds with a joint strength of not less than 3,400 pounds for gin universal density bales.

**1.2.1.2.2. Controlled-Slip Connection:** The connection should be achieved by heavily crimping both seal and straps. The connection shall permit up to 5 inches of relative movement at a minimum of 2,000 pounds of initial frictional force, and a minimum of 1,700 pounds of ultimate dynamic frictional force. Either an 8 or 6 strap configuration can be used as long as the tied loop length does not exceed 86 inches for universal density bales and 90 inches for standard density bales. The strapping shall have a

[1] Acknowledging that the Universal Bale Committee of the National Cotton Council in 1974 defined that Gin Universal bales be produced in press boxes of 54-55 inches long and 20-21 inches wide; That no bales of cotton are produced in "short bale" press boxes having length dimensions of 50-51 inches; That "short bales" do not meet the density definition of bale weight divided by bale volume and published annually since 1983 by the Joint Cotton Industry Bale Packaging Committee and subsequently adopted by the USDA as requirements for CCC loan eligibility; It is therefore recommended that for all future bale press installations that only presses meeting industry requirements of 54-55 inch length and 20-21 inch width dimensions will be acceptable as gin universal density.

minimum width of 0.75 inch, a minimum thickness of 0.025 inch, a minimum weight of 1 pound per 15.7 linear feet, a minimum breaking strength of 3,400 pounds, and a maximum of 5% elongation in a 6-inch sample. Controlled-slip strap shall be fabricated in a NAFTA country.

**1.2.2. Wire Ties:** Ties must be manufactured from wire, which conforms to ASTM A 510. Manufacturers shall follow a regular procedure of testing and inspection. Break tests shall be tested within a range from one-fourth inch to 5 inches per minute of elongation. Torsion testing must be performed according to sections 1.2.2.2.2.2, 1.2.2.2.2.3.2 and 1.2.2.2.5.1.4. Each bundle of wire shall bear a certification that the wire ties have been manufactured according to the specifications for Bale Packaging Materials as published by the JCIBPC. The certification shall also show the name and address of the wire tie manufacturer and contain a quality control code that will permit the ties to be identified to the 2,000-pound lot and/or wire carrier. Wire ties shall be fabricated within a NAFTA country.

**1.2.2.1. For Use on Flat Bales and Bales Compressed to Standard Density and Universal Density at a Warehouse:**

**1.2.2.1.1. Fabricated, Interlocking Wire:** Ties shall not be smaller than 10-gauge or equivalent cross-sectional area in the portion of the wire in which the connections are formed. Ties must have a minimum breaking strength of 1,850 pounds including the connection. For gin length wires manufactured with a reduced cross-sectional area (commonly referred to as waisted wire), the wire must be tested by the fabricator to assure reusability by formation of new connections in that length of the wire having the reduced area. Furthermore, strength requirements must meet those set for original specification of 1,850 pounds including the connection. Connections for testing reusability shall be formed on equipment predominantly used by the cotton industry for reclaiming gin wires for reuse on compress bales.

**1.2.2.1.2. Crosshead Type Wire:** Ties shall not be smaller than 10 gauge with a minimum joint strength of 1,650 pounds including the connection. The minimum elongation of the wire shall be 1 inch in 10-inch gauge length. Joints may be on flat sides of bales. Wire from gin length ties shall not be deemed useable for compress universal density or standard density if connections other than crosshead type are used on the recycled ties.

**1.2.2.1.3. Automatically Applied Wire:** Ties shall utilize a twistlock connection and not be smaller than 10-gauge. The connection shall permit up to 2 inches of elongation at a minimum of 1,800 pounds of initial frictional force and a minimum of 1,600 pounds of ultimate dynamic frictional force with the connections on the crowns or sample sides of the bales.

**1.2.2.2. For Use on Gin Standard and Gin Universal Density Bales:**

**1.2.2.2.1. High Tensile Steel 0.148 Inch Diameter 200 Ksi Wire:** In the portion of the wire in which the connections are formed, ties shall be not smaller than 0.148 inch in diameter (9 gauge) or equivalent cross-sectional area of 0.0172 square inches (minus 5% tolerance). The breaking strength of the wire must be not less than 3,400 pounds with a joint strength of not less than 2,100 pounds. A minimum of eight wires shall be used. The joints must be placed on the crowns or sample sides of the bales.

**1.2.2.2.2. High Tensile Steel 0.140 Inch Diameter 240 Ksi Wire:** The full diameter of wire shall not be smaller than 0.140 inch (approximately 9 1/2 gauge) or equivalent cross-sectional area of 0.0154 square inches. A minimum of eight wires shall be used. The joints must be placed on the crowns or sample sides of the bales.

**1.2.2.2.2.1. Joint Strength:** The minimum joint strength must be not less than 2310 pounds.

**1.2.2.2.2.2. Torsion Requirement:** Torsion testing must be conducted in accordance with ASTM Standard A938. Total turns to fracture shall not be less than 16 turns in a 10-inch test length. Tests shall be conducted on round wire, not waisted wire.

**1.2.2.2.3. High Tensile Steel 0.148 inch Diameter 240 Ksi Wire:** In the portion of the wire in which the connections are formed, ties shall be no smaller than 0.148 inches in diameter (9 gauge) or equivalent cross-sectional area of 0.0172 square inches (minus 5% tolerance). The length of the tie must not be greater than 88 inches for gin universal density bales or must not be greater than 92 inches for gin standard density bales. The joints must be placed on the crown or sample side of the bale. The six required ties must be spaced along the bale length with no less than 9 inches between adjacent ties.

**1.2.2.2.3.1. Joint Strength:** The minimum joint strength must be not less than 2400 pounds.

**1.2.2.2.3.2. Torsion Requirement:** Torsion test must be conducted in accordance with ASTM Standard A938. Total turns to fracture shall not be less than 16 turns in a 10-inch test length. Tests shall be conducted on round, not waisted, wire.

**1.2.2.2.4. High Tensile Steel 0.162 Inch Diameter 200 Ksi Wire:** In the portion of the wire in which the connections are formed, ties shall be not smaller than 0.162 inch in diameter (approximately 8 gauge) or equivalent cross-sectional area of 0.0206 square inches (minus 5% tolerance). The length of tie must be not greater than 88 inches for gin universal density bales. The breaking strength of the wire must be not less than 4,350 pounds with a joint strength of not less than 2,600 pounds. The joints must be placed on the crowns or sample sides of the bales. The six required ties must be spaced along the bale length with no less than 9 inches between adjacent ties.

**1.2.2.2.5. Automatically Applied Galvanized Wire**: Twist knots shall be fabricated at the gin using Ultra Twist® Wire Tying System.

**1.2.2.2.5.1. Galvanized 0.1350 Steel Wire:** The full diameter of the wire shall be no smaller than 0.1350 inches (10 gauge) or equivalent cross-sectional area of 0.0143 square inches (minus 5% tolerance).

**1.2.2.2.5.1.1. Length:** The length of the tie must not be greater than 88 inches for gin universal density bales.

**1.2.2.2.5.1.2. Galvanization:** Wire will have a galvanized coating density of 0.18 ounces/square foot, with a tolerance of +/- 0.05 ounces/square foot.

**1.2.2.2.5.1.3. Strength:** The average breaking strength of the wire must be not less than 2,931 pounds. The average minimum joint strength must be not less than 2578 pounds

**1.2.2.2.5.1.4. Torsion Requirement:** Torsion test must be conducted in accordance with ASTM Standard A938. Total turns to fracture shall not be less than 12 turns in a 10-inch test length. Tests shall be conducted on round, not waisted, wire.

**1.2.2.2.5.1.5. Placement:** The twist knot must be placed in recesses on the hard or flat side of the bale. The six required wire ties must be spaced along the bale length with no less than 9 inches between adjacent ties.

**1.2.2.2.5.1.6. Recesses or Channels:**

**1.2.2.2.5.1.6.1. Formation of Recesses or Channels:** Recesses or channels shall be created by the installation of vertical steel flat stock or other steel bars on the inside of gin press boxes.

**1.2.2.2.5.1.6.2. Advisory and Disclaimer:** Gin operators should be advised that improper installation of steel bars might create potential risks to bale or fiber quality, equipment or workers. Therefore, ginners are urged to consult their respective gin press manufacturers prior to any addition or modification to the gin press.

**1.2.3. Polyester (Polyethylene Terephthalate) Plastic Strapping for Use on Gin Standard and Gin Universal Density Bales:**[2] Ties must be manufactured in accordance with ASTM D3950. Each coil of strapping shall bear a certification that the plastic strapping has been manufactured according to the specifications for Bale Packaging Materials as published by the JCIBPC. The certification shall also show the name and address of the plastic strapping manufacturer and contain a quality control code that will permit the strapping to be identified to the coil or strapping carrier. Plastic strapping shall be fabricated within a NAFTA country. Plastic strapping joints shall be fabricated at the gin using either patented z-weld friction technology, Model G20A6PE hot blade weld technology, or P600 friction weld technology.

**1.2.3.1. Placement:** Plastic strapping must be placed in recesses or channels on the flat sides of the bale. These recesses or channels provide a measure of protection of tying materials from handling forces and maintain integrity of bale cover fabrics. The six required ties must be spaced uniformly along the bale length. The P600 weld shall be placed on the crown (round side) of the bale.

**1.2.3.1.1. Recesses or Channels:**

**1.2.3.1.1.1. Formation of Recesses or Channels:** Recesses or channels shall be created by the installation of vertical steel flat stock or other steel bars on the inside of gin press boxes.

**1.2.3.1.1.2. Advisory and Disclaimer:** Gin operators should be advised that improper installation of steel bars might create potential risks to bale or fiber quality, equipment or workers. Therefore, ginners are urged to consult their respective gin

[2] Users of polyester (polyethylene terephthalate) plastic materials are advised that best performance is for use in gins where there are commitments of ginners to press bales in accordance with platen separation, lint distribution, tie length and moisture management recommendations as included in industry educational materials of the Joint Cotton Industry Bale Packaging Committee along with other quality assurance procedures as required by polyester (polyethylene terephthalate) plastic manufacturers. While any tying or strapping material may be damaged, polyester (polyethylene terephthalate) plastic materials are especially subject to damage due to multiple handling, re-concentration or certification, and may be subject to subsequent repairs to restore bales to merchantable conditions and mill acceptability.

press manufacturers prior to any addition or modification to the gin press.

**1.2.3.2. Color:** The strap must be translucent green or opaque green.

**1.2.3.3. Gauge:** The average strap gauge or thickness when machines use the z-weld friction technology shall be not less than 0.055 inch. The average strap gauge or thickness when machines use the Model G20A6PE hot blade weld technology or the P600 friction weld technology shall be not less than 0.060 inch.

**1.2.3.4. Gauge Tolerance:** The thickness of any 2 evenly spaced points across the width of a strap must be within plus or minus 4 percent of the average gauge thickness for that strap.

**1.2.3.5. Width:** The average width shall be not less than 0.75 inch.

**1.2.3.6. Width Tolerance:** The range of any 2 evenly spaced points along the length of a strap must be within plus or minus 4 percent of the average width for that strap.

**1.2.3.7. Break Strength:** The average break strength must be not less than 2400 pounds. The minimum break strength must be not less than 2250 pounds.

**1.2.3.8. Elongation:**

**1.2.3.8.1. Elongation at Break Strength:** The elongation at break must be not less than 12 percent nor greater than 16 percent.

**1.2.3.8.2. Elongation at 1000 Pounds Tension:** The elongation at 1000 pounds tension should be not greater than 4 percent.

**1.2.3.9. Joint Strength:** The average joint strength must be not less than 2200 pounds. The minimum joint strength must be not less than 1950 pounds.

**1.2.3.10. Tare Weight:** Tare weight shall be not less than 1 pound per 6 straps.

**1.2.3.11. Strap Length:** Each strap shall be not greater than 86 inches in length when used with 54-55 inch by 20-21 inch presses.

**1.2.3.12. Inspection and Certification Requirements:**

**1.2.3.12.1. Responsibility for Inspection:** The strap manufacturer and the supplier are both responsible for performance of all inspection requirements as specified herein. They may use their own or any other facilities suitable for the performance of such inspection requirements, unless such facilities are disapproved by the JCIBPC.

**1.2.3.12.2. Right to Perform Inspection or Testing:** Reasonable inspection or tests deemed necessary may be performed by the JCIBPC to assure that materials conform to prescribed specifications.

**1.2.3.12.3. Inspection or Testing Expense:** Expense for such inspection or testing shall be borne by the strap manufacturer or supplier.

**1.2.3.12.4. Certification Required by the JCIBPC:**

**1.2.3.12.4.1. Submission of Samples:** All manufacturers of polyester strapping must submit samples to a private testing laboratory selected by the JCIBPC for certification that materials meet all prescribed specifications.

**1.2.3.12.4.2. Approved List:** Upon receipt of testing results, the JCIBPC will publicize throughout the cotton industry a list of approved manufacturers and their trademarks.

**1.2.3.12.4.3. Responsibility for Components and Materials:** The strap manufacturers shall be responsible for insuring that straps are manufactured examined and tested in accordance with approved specifications and standards for polyester described in sections 1.2.3.1 through 1.2.3.11.

**1.2.3.12.4.4. Certification of Strapping Furnished:** Strapping manufacturers and/or suppliers shall certify to customers that the strap furnished has been manufactured in a NAFTA country for use as cotton bale ties and meets the material specifications herein, and that the manufacturer is on the JCIBPC's approved list.

**1.2.3.13. Test Methods for Polyester Strapping:**

**1.2.3.13.1. Sample Size:** Each sample size of polyester strapping will consist of twenty straps 86 inches in length randomly selected from production lines.

**1.2.3.13.2. Gauge and Gauge Tolerance:** The gauge and gauge tolerance shall be tested in accordance with ASTM D374.

**1.2.3.13.3. Break Strength and Elongation:** The break strength, elongation at break and elongation at 1000 pounds tension shall be tested in accordance with ASTM D882 and ASTM D3950.

**1.2.3.13.4. Joint Strength:**

**1.2.3.13.4.1. Preparation of Specimens:** The joints shall be formed by either patented z-weld friction technology, Model G20A6PE hot blade weld technology, or P600 friction weld technology.

**1.2.3.13.4.2. Testing:** The joint strength shall be tested in accordance with ASTM D882 and ASTM D3950.

## 2. SPECIFICATIONS FOR BAGGING

### 2.1. General Requirements

All bagging material must be clean, in sound condition, and of sufficient strength to adequately protect the cotton. The material must not have salt or other corrosive material added and must not contain sisal or other hard fiber or any other material that will contaminate or adversely affect cotton as determined by the JCIBPC. Bagging which has been cut to obtain samples must be patched prior to shipment from warehouse using an industry recommended material and technique, so that the bale is fully covered.

Metal fire tags, typically placed on bands or wires, should not be used unless required by governing state laws or an applicable insurance policy. Hog rings, metal staples or other types of metal should not be used to close bale heads or secure bagging in any way. However, small gauge wires on bale tags are acceptable.

### 2.2. Approved Materials

**2.2.1. Spiral Sewn Burlap Bags:**

**2.2.1.1. General:** Spiral sewn burlap bags may be used to wrap gin standard density and gin universal density bales and bales compressed to standard density and universal density at a warehouse.

**2.2.1.2. Material:** Bags must be spiral sewn from new burlap with an average weight of not less than 10 ounces per linear yard (40-inch width) at 13.75 percent moisture content -- not moisture regain. The material must have a true selvage on each side. Spiral sewn bags made from split burlap with raw edges will not be acceptable. Joint bags are not acceptable.

**2.2.1.3. Fabric Count:** Fabric must contain not less than 11, nor more than 13 warp yarns per inch [of a size equal to or larger than the weft (filling) yarns] and must contain not less than 10, nor more than 12, weft (filling) yarns per inch. (This count is equal to 47 yarns per decimeter plus or minus 4 percent for both the ends and picks directions.)

**2.2.1.4. Bag Size:** Bag size must be tailored to individual bale size at each location. Bags shall fit bales tightly, but must be large enough to minimize bursting and long enough to completely cover and secure heads of bales. The minimum finished bag length shall be not less than 97 inches.

**2.2.1.5. Seams:** Seams must be sewn with a type 401 stitch, minimum four stitches per inch, and 12/4 or 12/5 cotton thread, or a polypropylene thread with an approximate yarn denier of 1,000, meeting ultraviolet inhibitor concentration requirements of 2.2.4.2.3, with a minimum tensile strength of 11.02 pounds or a Heracles stitch with a minimum of 10 stitches per 4 inches using a 10/4 cotton thread or jute thread of equal or greater strength.

**2.2.1.6. Identification Markings:**

**2.2.1.6.1. Bale of Bags:** Each bale of spiral sewn burlap bags shall have legibly stenciled on the outside the name of the bag manufacturer and the importer. Bag manufacturers and importers shall follow a regular procedure of testing and inspection.

**2.2.1.6.2. Bag:** Each spiral sewn bag must have the name, trademark or code of the bag manufacturer (that is, the company fabricating the bag), the product importer (company bringing the finished bag into the U.S. or NAFTA country bag fabricator in the case of imported rolled goods), and the fabric weight (10 ounces per 40 inch width) denoted as "10 oz/40 in", legibly printed or stenciled with ink of a visible color no less than once on each bag. The identification markings shall be placed on record with the JCIBPC. The bag or fabric importer shall register the name or trademark with the JCIBPC.

**2.2.1.7. Inspection and Certification Requirements:**

**2.2.1.7.1. Responsibility for Inspection:** The bag manufacturer, importer, and supplier are responsible for performance of all inspection requirements as specified herein. They may use their own or any other facilities suitable for the performance of such inspection requirements, unless such facilities are disapproved by the JCIBPC.

**2.2.1.7.2. Right to Perform Inspection or Testing:** Reasonable inspection or tests deemed necessary may be performed by the JCIBPC to assure that materials conform to prescribed specifications.

**2.2.1.7.3. Inspection or Testing Expense:** Expense for such inspection or testing shall be borne by the fabric or bag importer registering the trademark.

**2.2.1.7.4. Certification Required by the JCIBPC:**

**2.2.1.7.4.1. Submission of Samples:** All bag importers or NAFTA country fabricators of burlap must submit samples to a private testing laboratory selected by the JCIBPC for certification that materials meet all prescribed specifications.

**2.2.1.7.4.2. Approved List:** Upon receipt of testing results, the JCIBPC will publicize throughout the cotton industry a list of approved bag importers or domestic fabricators and their trademarks.

**2.2.1.7.4.3. Responsibility for Components and Materials:** The fabric or bag importers shall be responsible for insuring that fabrics are manufactured, examined and tested in accordance with approved specifications and standards. The bag importer or domestic fabricator shall be responsible for insuring that all specifications for spiral-sewn burlap are met.

**2.2.1.7.4.4. Certification of Fabric Furnished:** NAFTA country fabricators or bag importers shall certify to customers that the bag furnished has been manufactured for use as cotton bale covers and meets all specifications herein, and that the importer and or fabricator is on the JCIBPC's approved list.

**2.2.1.8. Test Methods:**

**2.2.1.8.1. Sample Size:** Burlap material selected for testing will consist of a minimum of seven randomly selected spiral sewn bags or an equivalent amount of flat goods in cases where the material is tested before it is in sewn form. Any one bag or equivalent fabric not meeting specifications listed herein constitutes failure.

**2.2.1.8.1.1. Fabric Count:** The number of warp ends in the width of the sample including the selvage will be counted at each end of the sample. The average of the two counts will be divided by the width as measured with a suitably graduated device; this number will represent the warp ends per inch. The number of weft (picks) gains shall be counted once per 36-inch width of fabric. This number will be divided by 36 to determine the number of weft (picks) per inch.

**2.2.1.8.1.2. Fabric Weight:** The weight of the fabric will be determined by weighing on suitably accurate scales a 36 inch by 40 inch piece of fabric to the nearest tenth of an ounce. The weight will be determined on the basis of 13.75 percent moisture content (not moisture regain). The average of seven samples will constitute the weight for that sample set. The average weight of the sample set should be not less than 10 ounces per linear yard (40-inch width). The weight of any individual sample within the sample set may not be lighter than 9.5 ounces per linear yard (40-inch width).

**2.2.2. Cotton Bagging:**

**2.2.2.1. General Requirements:**

**2.2.2.1.1. Weight:** Bagging made from 100 percent cotton must weigh not less than 7.7 ounces per square yard with a minimum weight of 4 pounds per pattern for flat and modified bales, 3.1 pounds for gin standard density bales, and 3 pounds for gin universal density bales and bales compressed at a warehouse at 8.5 percent moisture content (not moisture regain).

**2.2.2.1.2. Woven:** The bagging must contain not less than 120 warp yarns (plied or single per 12 inches of bagging of a size equal to or larger than the weft (filling) yarns and must contain not less than 78 weft (filling) yarns (plied or single) per 12 inches of bagging.

**2.2.2.1.3. Warp Knitted:** The bagging must be constructed with not less than two guide bars and must contain not less than five wales per inch and not less than six courses per inch. All yarns (plied or single) must be form connected with each other. The bagging must have stabilized construction with elongation or stretch not less than 15 percent or more than 30 percent. Variation in tensile strength in wale and course direction must not exceed 20 percent. The bagging must have a minimum bursting strength of 75 pounds.

**2.2.2.2. Bag and Panel Combination Used to Wrap Flat and Modified Flat Bales:**

**2.2.2.2.1. Panel:** The panel of bagging must not be less than 48 inches in width and 112 inches in length for flat or modified flat bales. Each panel must be constructed with true selvages on each side.

**2.2.2.2.2. Bag:**

**2.2.2.2.2.1. Material:** The bag may be constructed of warp knitted fabric as specified in Section 2.2.3.1.3 or woven fabric as specified in Section 2.2.3.1.2.

**2.2.2.2.2.2. Bag Size:** The bag size must be tailored to individual bale sizes at each location. The bag shall be not less than 36 inches in depth.

**2.2.2.2.2.3. Seams:** Seams must be sewn with a type SSa-1 (flat) or LSa-1 (overlap) seam, type 401 stitch, minimum 6 stitches per inch with 4/12 or 5/12 cotton thread.

**2.2.2.3. Bags for Use on Gin Standard Density, Gin Universal Density, and Bales Compressed at a Warehouse:**

**2.2.2.3.1. Material:** The bagging may be constructed of woven cotton fabric meeting specifications in Section 2.2.2.1.2 or warp knitted cotton fabric meeting specifications in Section 2.2.2.1.3. For bags made of warp knitted fabric, bags may be constructed with two panels sewn on each side to form a bag or form a single folded pattern. For bags made of woven cotton fabric, bags must be spiral sewn from fabric a minimum of 60 inches in width.

**2.2.2.3.2. Size:** The bag size must be tailored to individual bale sizes at each location. Bags shall fit bales tightly but must be large enough to minimize bursting and long enough to completely cover and secure heads.

**2.2.2.3.3. Seams:** Seams must be sewn with a type SSa-1 (flat), SSn-1 (folded) or LSa-1 (overlap) seam, type 401 stitch, minimum 6 stitches per inch with 4/12 or 5/12 cotton thread. Sewn seams at bottom of bags must be a minimum of three-fourths inch from edges and be of type SSa-1 (flat).

**2.2.2.4. Test Methods for Cotton Bagging:**

**2.2.2.4.1. Sample Size:** Each sample of cotton bagging selected for testing will consist of one pattern of either bag and panel combination, sewn bag, or two panels.

**2.2.2.4.2. Length:** The length of the sample will be measured directly using a suitably graduated device. The sample will be laid out flat on a smooth horizontal surface and the length measured along both selvages for cotton panels. The length of the sample will be the average of the two measurements rounded to the nearest inch. Measurements will be made on the sample in equilibrium with standard atmospheric conditions as specified in ASTM D1776.

**2.2.2.4.3. Width:** Sample width will be measured directly using a suitably graduated device and will include the selvages. The sample will be laid out flat on a smooth horizontal surface and the measurements made perpendicular to the lengths (selvages in the case of panels). Three width measurements will be taken on each sample. One measurement will be made at the center of the sample and two other measurements will be approximately 12 inches in from each end of the sample. The average of the three measurements, rounded to the nearest inch, will be the width. Measurements will be made on the sample in equilibrium with standard atmospheric conditions as specified in ASTM D1776.

**2.2.2.4.4. Weight of Bagging:** The weight of bagging will be determined by weighing on suitably accurate scales, and the weight per pattern will be determined to the nearest one-tenth pound. Several patterns (or bales of bagging patterns) may be weighed simultaneously and the weight averaged. The weight for cotton bagging will be calculated on the basis of 8.5 percent moisture content (not moisture regain).

**2.2.2.4.5. Woven Cotton Bagging:**

**2.2.2.4.5.1. Warp Yarn Count:** The number of warp ends in the width of the sample including the selvages will be counted at each end of the sample. The average of the two counts will be divided by the width, as determined above. This figure will be multiplied by 12 to determine warp yarns per 12 inches of bagging.

**2.2.2.4.5.2. Weft Yarn Count:** The number of weft (filling) yarns over a measured length of 36 inches on each sample of woven cotton bagging will be counted. The number counted divided by 3 will be the weft yarn count per 12 inches.

**2.2.2.4.6. Warp Knitted Cotton Bagging:**

**2.2.2.4.6.1. Wale Count of Warp Knitted Cotton Bagging:** The number of wales or ribs running lengthwise of the sample will be counted over a measured width (relaxed state) of 12 inches on each sample. The number counted divided by 12 will be the wale count per inch.

**2.2.2.4.6.2. Course Count of Warp Knitted Cotton Bagging:** The number of courses or loops which form a line horizontal to the wales or ribs will be counted over a measured length (relaxed state) of 12 inches on each sample of warp knitted cotton bagging. The number counted divided by 12 will be the course count per inch.

**2.2.2.4.6.3. Elongation:** Elongation or stretch properties of warp knitted cotton bagging will be tested on one pound per inch static load using methods as specified in ASTM D2594E.

**2.2.2.4.6.4. Bursting Strength:** Bursting strength will be tested on an approved type of constant rate of traverse machine equipped with a bursting attachment (ball burst) as specified in ASTM D231.

### 2.2.3. Polyethylene Film Bagging:[3]

**2.2.3.1. General:** Polyethylene film shall be extruded and fabricated in a NAFTA country from virgin resin supplied by NAFTA-country resin manufacturers, for use on gin standard density and gin universal density bales and bales compressed at a warehouse.

**2.2.3.2. Type:**

**2.2.3.2.1. Linear Low Density:** The bag must be 100% linear low density polyethylene from a copolymer of ethylene and octene 1 base, hexene base or metallocene resin.

**2.2.3.2.2. Tri-Extruded:** The bag must be only a combination of linear low density polyethylene from a copolymer of ethylene and octene 1 base, hexene base, or metallocene base resin, high molecular weight high density polyethylene resin, and fractional melt, low density polyethylene resin.

**2.2.3.3. Color:** The bag must be clear light brown, or yellow tinted. If the bag is light brown, the bag must contain a minimum of 5% pigment for color.

**2.2.3.4. Gauge:** The average gauge shall be not less than 6 mil.

**2.2.3.5. Gauge Tolerance:** The range of any 20 evenly spaced points around the width (traverse or cross direction) of a bag must be within plus or minus 10 percent of the average gauge for that bag.

**2.2.3.6. Tensile Strength:** For machine (length) direction the tensile strength must be not less than 38.3 pounds per inch (6,380 pounds per square inch for a 6 mil material), and for traverse (cross) direction, not less than 33.0 pounds per inch (5,500 pounds per square inch for a 6 mil material).

**2.2.3.7. Elongation:** For both machine (length) and traverse (cross) direction the recommended elongation is 800 percent.

**2.2.3.8. Tear Resistance:** The material shall have a minimum tear resistance of 300 grams/mil in the machine (length) direction and 400 grams/mil in the traverse (cross) direction.

**2.2.3.9. Impact Resistance:** The impact resistance must be not less than 660 grams.

**2.2.3.10. Slip Characteristics:** Bags must be low slip (static coefficient of friction not less than 0.50 for outside of material to outside of material test).

**2.2.3.11. Tagging:** Extra precaution must be taken in securing bale tags to prevent lost tags.

**2.2.3.12. Tare Weight:** Tare weight shall be not less than 1.6 pounds per bag.

**2.2.3.13. Sealing Heads of Bales:** Extra precaution must be taken in sealing heads of bales to provide maximum coverage and protection.

**2.2.3.14. Bag Size:** Each bag shall be not less than 85 inches in length when used on 54-55 inch by 20-21 inch presses.

**2.2.3.15. Identification Markings:** Each bag must have identification markings to denote type (see 2.2.3.15.1 and 2.2.3.15.2) suitably printed no more than 36 inches apart. Each bag must also have the name or trademark of the film extruder and the universal recycle logo with appropriate recycle code (#4 for LLDPE) suitably printed no more than 36 inches apart. Each identification mark shall be at least three-fourths inch in height. The identification markings shall be placed on record with the JCIBPC. Ink of any color but white shall be used for printing logos. Where bags are fabricated by manufacturers other than the film supplier, the fabricator's name or trademark shall appear on each bag in addition to the film extruder's name or trademark. The bag fabricator, when other than the film manufacturer, shall register the name or trademark with the JCIBPC.

**2.2.3.15.1. Linear Low Density:** Bag type identification markings must read either "NEW--100% linear low density polyethylene" or "NEW--100% LLDPE."

**2.2.3.15.2. Tri-Extruded:** Bag type identification markings must read "NEW--Tri-Extruded Polyethylene."

**2.2.3.16. Inspection and Certification Requirements:**

**2.2.3.16.1. Responsibility for Inspection:** The film manufacturer and the supplier are both responsible for performance of all inspection requirements as specified herein. They may use their own or any other facilities suitable for the

[3] While bales covered in polyethylene film materials meet requirements for bale loan eligibility, users of polyethylene film packaging materials should be advised that best performance is for use in gins, warehouses and marketing systems which impose limited storage and handling requirements on the bale such as in gin-warehouse shipments which go directly to textile mills or into containers for export. While any packaging material may be damaged, polyethylene film materials are especially subject to damage due to multiple handling, re-concentration or certification, and may be subject to warehouse charges to restore bales to merchantable conditions.

performance of such inspection requirements, unless such facilities are disapproved by the JCIBPC.

**2.2.3.16.2. Right to Perform Inspection or Testing:** Reasonable inspection or tests deemed necessary may be performed by the JCIBPC to assure that materials conform to prescribed specifications.

**2.2.3.16.3. Inspection or Testing Expense:** Expense for such inspection or testing shall be borne by the film manufacturer or supplier.

**2.2.3.16.4. Certification Required by the JCIBPC:**

**2.2.3.16.4.1. Submission of Samples:** All manufacturers of polyethylene must submit samples to a private testing laboratory selected by the JCIBPC for certification that materials meet all prescribed specifications.

**2.2.3.16.4.2. Approved List:** Upon receipt of testing results, the JCIBPC will publicize throughout the cotton industry a list of approved manufacturers and their trademarks.

**2.2.3.16.4.3. Responsibility for Components and Materials:** The film and/or bag manufacturers shall be responsible for insuring that films or bags are manufactured, examined and tested in accordance with approved specifications and standards for polyethylene described in sections 2.2.3.1 through 2.2.3.15.

**2.2.3.16.4.4. Certification of Film Furnished:** Film manufacturers and/or fabricators shall certify to customers that the film furnished has been manufactured in a NAFTA country for use as cotton bale covers and meets the material specifications herein, and that the manufacturer is on the JCIBPC's approved list.

**2.2.3.17. Test Methods for Polyethylene Bags:**

**2.2.3.17.1. Sample Size:** Each sample of polyethylene will consist of one bag.

**2.2.3.17.2. Length:** The length of the sample will be measured directly using a suitably graduated device. The sample will be laid out flat on a smooth horizontal surface and the length measured. Each side will be measured from top edge to bottom edge. The length of the sample will be the average of the two measurements rounded to the nearest inch.

**2.2.3.17.3. Weight of Bagging:** The weight of bagging will be determined by weighing on suitably accurate scales, and the weight per bag will be determined to the nearest one-tenth pound. Several bags may be weighed simultaneously and the weight averaged.

**2.2.3.17.4. Gauge and Gauge Tolerance:** The gauge and gauge tolerance shall be tested in accordance with ASTM D374.

**2.2.3.17.5. Tensile Strength and Elongation:** The tensile strength and elongation shall be tested in accordance with ASTM D882.

**2.2.3.17.6. Tear Resistance:** Tear resistance shall be tested in accordance with ASTM D1922 (Elmendorf Tear) using a 6400 gram pendulum.

**2.2.3.17.7. Impact Resistance:** Impact resistance shall be tested in accordance with ASTM D1709, Method A, using an aluminum dart.

**2.2.3.17.8. Slip Characteristics:** Slip characteristics shall be tested in accordance with ASTM D1894.

**2.2.4. Polypropylene Bagging:**

**2.2.4.1. General:** Polypropylene material used to wrap bales shall be new polypropylene fabric manufactured in a NAFTA country from yarn and resins produced in a NAFTA country and woven specifically for use on cotton bales. The bale covers shall be uniform in size and color, clean, unstained, and free of any extraneous material.

**2.2.4.2. Yarns:** Scrap, reground, or reworked polymers may be used for yarns, provided material meets all specifications under 2.2.4.

**2.2.4.2.1. Type:** The yarn shall be crystalline or isostatic polypropylene type yarns.

**2.2.4.2.2. Dimension:** For fabric constructions of 12 warp yarns per inch and 8 weft yarns per inch, the warp yarn dimensions shall be 2.1 mils thick, plus or minus 0.2 mil and 95 mils wide, plus or minus 2 mils. Filling yarn dimensions shall be not less than 1.8 mils thick, plus or minus 0.2 mil with a minimum linear density of 1050 denier. For fabric constructions of 12 warp yarns per inch and either 8.5 or 9.5 weft yarns per inch, the warp yarn dimensions shall be 80 mils wide, plus or minus 5 mils, with a linear density of 840 denier, plus 100 denier or minus 50 denier. Filling yarn dimensions shall be 95 mils wide, plus or minus 5 mils, with a minimum linear density of 890 denier, plus 100 denier or minus 50 denier. For fabric constructions of 10 warp yarns per inch and 7 weft yarns per inch, the warp yarn dimensions shall 100 mils wide, plus or minus 5 mils, with a linear density of 1050 denier, plus or minus 50 denier. Filling yarn dimensions shall 110 mils wide, plus or minus 5 mils, with a linear density of 1050 denier, plus or minus 50 denier. For fabric constructions of 11.3 warp yarns

per inch and 6 weft yarns per inch, the warp yarn dimensions shall be 90 mils wide, plus or minus 5 mils, with a linear density of 900 denier, plus or minus 50 denier. Filling yarn dimensions shall be 115 mils wide, plus or minus 5 mils, with a linear density of 1300 denier, plus or minus 50 denier.

**2.2.4.2.3. Inhibitor Concentration:** For yarns stabilized with a hindered amine light stabilizer (HALS), the yarn shall contain one or a combination of Tinuvin 622 LD and Chimassorb 944 from Ciba-Geigy Corporation or other equivalent HALS at a total concentration of not less than 0.3 percent weight of active inhibitor. The known and consistent concentrations of each combined HALS shall be placed on record with the JCIBPC.

**2.2.4.2.4. Trace Element:** Additionally, when HALS inhibitors are used, the yarn must also contain a trace element of barium sulfate at a concentration of not less than 0.05 percent by weight that must be detectable after weathering for identification purposes. The JCIBPC will have samples checked periodically by a private laboratory at manufacturers' expense.

**2.2.4.3. Fabric Woven from Stabilized Yarns:**

**2.2.4.3.1. Fabric Count:** For 12 x 8 constructions, there must be an average of 12 warp yarns per inch and an average of 8 weft yarns per inch. No test sample shall contain less than 11 warp yarns or 7 weft yarns per inch. For 12 x 8.5 constructions, there must be an average of 12 warp yarns per inch and an average of 8.5 weft yarns per inch. No test sample shall contain less than 11 warp yarns or 7.5 weft yarns per inch. For 12 x 9.5 constructions, there must be an average of 12 warp yarns per inch and an average of 9.5 weft yarns per inch. No test sample shall contain less than 11 warp yarns or 8.5 weft yarns per inch. For 10 x 7 constructions, there must be an average of 10 warp yarns per inch and an average of 7 weft yarns per inch. No test sample shall contain less than 9.5 warp yarns per inch or 6.5 weft yarns per inch. For 11.3 x 6 constructions, there must be an average of 11.3 warp yarns per inch and an average of 5.9 weft yarns per inch. No test sample shall contain less than 10.8 warp yarns or 5.4 weft yarns per inch.

**2.2.4.3.2. Minimum Weight:** For 12 x 8 fabric constructions, the non-extrusion coated fabric must weigh an average of not less than 2.7 ounces per square yard and no test sample shall weigh less than 2.5 ounces per square yard. For 12 x 8.5 fabric constructions, the non-extrusion coated fabric must weigh an average of not less than 2.3 ounces per square yard and no single test sample shall weigh less than 2.1 ounces per square yard. For 12 x 9.5 fabric constructions, the non-extrusion coated fabric must weigh an average of not less than 2.5 ounces per square yard and no single test sample shall weigh not less than 2.3 ounces per square yard. For 10 x 7 fabric constructions, the non-extrusion coated fabric must weigh an average of not less than 2.3 ounces per square yard and no single test sample shall weigh less than 2.1 ounces per square yard. For 11.3 x 6 fabric constructions, the coated fabric must weigh an average of not less than 3.2 ounces per square yard and no test sample shall weigh less than 3.0 ounces per square yard.

**2.2.4.3.3. Color:**. The color of the fabric containing HALS shall be translucent white or translucent light gold unless otherwise approved by the JCIBPC. The center of each panel, for bag and panel combinations, must be marked in the weft direction with a clearly visible line printed with ink of any color but white or black running across the entire width of the panel or with a series of three lines having a minimum of 12 inches on each edge and a minimum of 12 inches in the center. The lines must be within one inch of the true center of the length of the panel.

**2.2.4.3.4. Tensile Strength:** For 12 x 8, 12 x 8.5 or 9.5 and 10 x 7 fabric constructions, minimum tensile strengths of uncoated fabrics shall be 125 pounds per inch average in the warp direction and 90 pounds per inch average in the weft direction. For 11.3 x 6 fabric constructions, minimum tensile strengths of coated fabric shall be 125 pounds per inch average in the warp direction and 90 pounds per inch average in the weft direction. Ten samples shall be tested in each direction for this determination and no single test shall be more than 10 pounds per inch below the specified average.

**2.2.4.3.5. Elongation:** The fabric shall have an elongation to break of not less than 15 percent average in both warp and weft directions. Ten samples shall be tested in each direction for this determination and no single test value shall be below 12 percent.

**2.2.4.3.6. Selvage:** Each outer edge of the fabric shall be tucked selvage or natural selvage containing not less than the number of weft ends prevalent in the body of the fabric. A heat cut selvage will not be acceptable. Ends of cut sheets and spiral-sewn bags must be finished by heat cutting to give a pin test value of at least 40 pounds. For 11.3 x 6 fabric constructions, the fabric shall have mechanically cut edges in such a fashion that the yarns are held in position by the coating.

**2.2.4.3.7. Air Permeability:** The non-extrusion coated fabric in an unstressed state must permit not less than 5 cubic feet per minute per square foot, nor more than 50 cubic feet per minute per square foot of air flow.

**2.2.4.3.8. Weathering Resistance:** The fabric shall retain not less than 70 percent of its original tensile breaking strength after 1,200 hours exposure to accelerated weathering.

**2.2.4.4. Coatings:** Any coating added to the fabric to reduce gloss, fibrillation, slippage, or for other technical reasons, shall be as stable as the fabric to which it has been applied when exposed to accelerated weathering and low temperatures. Such coating must not adversely affect cotton which it is to contact. Polyolefin coating added to prevent fibrillation must be thermally bonded to woven polypropylene fabric by extrusion coating at a minimum thickness at any point of 0.75 mil. Coating must not delaminate during stresses of baling and compression.

**2.2.4.5. Extrusion-Coated Bag and Panel Combination Used to Wrap Flat and Modified Flat Bales:**

**2.2.4.5.1. Fabric Requirements:** Bag may be a shoebox or gussetted construction. Bottom of bag must be constructed from 12 x 8 or 12 x 8.5 count fabrics meeting applicable requirements of sections (2.2.4.1 through 2.2.4.4, 2.2.4.9 and 2.2.4.10). Sides of bag and sheet shall be constructed from 12 x 8 or 12 x 9.5 count fabrics meeting applicable requirements of sections (2.2.4.1 through 2.2.4.4, 2.2.4.9 and 2.2.4.10). End panels of bag may be either an extension of fabric from bottom of bag or side and meet all requirements of that fabric.

**2.2.4.5.2. Panel Size:** The panel for 54 x 24 inch presses (modified flat) shall be not less than 48 inches in width and 112 inches in length. The panel for 54 X 27 inch presses (flat) shall be not less than 52 inches in width and 112 inches in length.

**2.2.4.5.3. Bag Size:** The bag size must be tailored to individual bale size at each gin location. The bag shall be not less than 36 inches in depth.

**2.2.4.5.4. Seams:** Seams must be sewn in accordance with the following: Type SSa-1 (flat) seam, type 401 stitch, minimum four stitches per inch, and 4/12 or 5/12 cotton thread or a polypropylene thread with an approximate yarn denier of 1,000, meeting ultraviolet inhibitor concentration requirements of Section 2.2.4.2.3, with a minimum tensile strength of 11.02 pounds. All cuts shall be heat cut or shall be rolled to prevent raveling.

**2.2.4.5.5. Fabrication:** Bag shall be fabricated such that warp yarns run the length of the bale. Edges of bag in long dimension shall have tucked or natural selvages.

**2.2.4.5.6. Coating:** Coating on bottom of bag and panel shall meet requirements of Section 2.2.4.4. Panel shall be coated at a minimum width of 24 inches in the center of the panel's width and along the entire panel length. Bottom of bag shall be coated along entire length at a minimum width of 24 inches.

**2.2.4.6. Fully-Coated Spiral Sewn Bags Used to Wrap Flat and Modified Flat Bales:**[4]

**2.2.4.6.1. Conditionality:** Use of spiral sewn polypropylene bags on flat and/or modified flat bales that are to be recompressed requires cooperation and approval of receiving warehouse/compress. Compress must have facilities for removal of gin wires under bag prior to recompression.

**2.2.4.6.2. Material:** Fabric shall conform to the specifications for the 12 x 8 or 12 x 8.5 fabric construction meeting applicable requirements in Sections 2.2.4.1 through 2.2.4.4, 2.2.4.9 and 2.2.4.10.

**2.2.4.6.3. Fabric Width:** The fabric from which each bag is sewn shall be a minimum of 60 inches in width.

**2.2.4.6.4. Bag Size:** The bag size must be tailored to individual bale size at each location. Bags shall fit bales tightly, but must be large enough to slip down for sampling and to minimize bursting and long enough to completely cover and secure heads of bales.

**2.2.4.6.5. Seams:** Seams must be sewn in accordance with the following: Type SSn- 1 (folded), SSa-1 (flat), and LSa-1 (overlap), type 401 stitch, minimum four stitches per inch, and 4/12 and 5/12 cotton thread, or a polypropylene thread with an approximate yarn denier of 1,000, meeting ultraviolet inhibitor concentration requirements of Section 2.2.4.2.3, with a minimum tensile strength of 11.02 pounds. Sewn seams at bottom of bags must be a minimum of three-fourths inch from heat cut edges and be of type SSa-1 (flat). Color of polypropylene

[4] For bales subject to recompression: due to the need for high capital investment, specialized handling practices, and increased labor to recompress bales in bags, for warehouses other than those who have successfully demonstrated practical methods for removing bands from bales prior to recompression, bales must be identified with the JCIBPC as experimental bales and must receive prior agreement between the ginner and warehouseman responsible for recompressing the bales.

sewing thread shall be white or natural color inherent in meeting ultraviolet inhibitor specs.

**2.2.4.6.6. Coating:** Coating shall meet requirements of Section 2.2.4.4 and shall be applied across the entire width of the flat fabric. Coating must be located within 0.5 inches plus or minus 0.25 inches of the selvage edge.

**2.2.4.7. Fully-Coated Gussetted Spiral Sewn Bags Used to Wrap Gin Standard and Gin Universal Density Bales:**

**2.2.4.7.1. Material:** Fabric shall conform to the specifications for the 12 x 8, 12 x 8.5 or 10 x 7 fabric construction meeting applicable requirements in Sections 2.2.4.1 through 2.2.4.4, 2.2.4.9 and 2.2.4.10.

**2.2.4.7.2. Fabric Width:** The fabric from which each bag is sewn shall be a minimum of 60 inches in width.

**2.2.4.7.3. Bag Size:** The bag size must be tailored to individual bale size at each location. Bags shall fit bales tightly, but must be large enough to slip down for sampling and minimize bursting and long enough to completely cover and secure heads of bales. The gussets shall be of equal width, plus or minus 1 inch. The minimum finished bag length shall be not less than 85 inches.

**2.2.4.7.4. Seams:** Seams must be sewn in accordance with the following: Type SSn-1 (folded), SSa-1 (flat), and LSa-1 (overlap), type 401 stitch, minimum four stitches per inch, and 4/12 or 5/12 cotton thread, or a polypropylene thread with an approximate yarn denier of 1,000, meeting ultraviolet light inhibitor concentration and identification concentration requirements of Section 2.2.4.2.3, with a minimum tensile strength of 11.02 pounds. Sewn seams at bottom of bags must be a minimum of three-fourths inch from heat cut edges and be of type SSa-1 (flat). Color of polypropylene sewing thread shall meet color requirements of Section 2.2.4.3.3.

**2.2.4.7.5. Coating:** Coating shall meet requirements of Section 2.2.4.4 and shall be applied across the entire width of the flat fabric. Coating must be located within 0.5 inches plus or minus 0.25 inches of the selvage edge.

**2.2.4.7.6. Venting:** The bag shall be adequately vented without impairing the integrity of the bag.

**2.2.4.8. Fully-Coated Gussetted Extruded Seam Bags Used to Wrap Gin Standard and Gin Universal Density Bales:**

**2.2.4.8.1. Material:** Fabric shall conform to the specifications for 11.3 x 6 fully-coated fabric construction meeting applicable requirements of Sections 2.2.4.1 through 2.2.4.4, 2.2.4.9 and 2.2.4.10.

**2.2.4.8.2. Fabric Width:** The fabric from which each bag is fabricated shall be a minimum of 100 inches in width.

**2.2.4.8.3. Bag Size:** The bag size must be tailored to individual bale size at each location. Bags must fit bales tightly, but must be large enough to slip down for sampling and minimize bursting and long enough to completely cover and secure heads of bales. The gussets shall be of equal width, plus or minus 1 inch. The minimum finished bag length shall not be less than 80 inches, measured from sewn bottom seam to the mouth of the bag.

**2.2.4.8.4. Seams:** The bag shall be formed from a flat sheet of fabric by means of two seams. The first shall be a continuous extruded seam of polyolefin material joining the edges of the fabric panel to form a tube. Location of the seam shall be identified by the use of a pigment in the seaming material. The extruded seam shall have a minimum cut-strip tensile strength of 55 pounds per inch. At least 3 strips, 2 inches in width shall be cut parallel to the weft yarns from any bag to determine the seam strength. The bottom of the tube shall be closed with a type SSn-1 (folded) seam, chain stitch, minimum 3 stitches per inch, using a polypropylene thread with an approximate yarn denier of 1000, meeting ultraviolet light inhibitor concentration requirements of Section 2.2.4.2.3, with a minimum tensile strength of 11.02 pounds.

**2.2.4.8.5. Coating:** Fully-coated 11.3 x 6 fabric shall have a continuous polyolefin coating with an average thickness of 1.5 mils, plus or minus 0.2 mils meeting the requirements of Section 2.2.4.4.

**2.2.4.8.6. Venting:** The bag shall be adequately vented without impairing the integrity of the bag.

**2.2.4.9. Identification Markings:** Each panel and/or sewn bag must have the name or trademark of the fabric manufacturer (that is, the company weaving the material) and the appropriate yarn denier (either 840, 1050 or 900 x 1300) and construction (12 x 8.5 or 9.5, 12 x 8, 10 x 7, or 11.3 x 6) suitably printed no more than 36 inches apart in the center of each bag. Each identification mark shall be at least three-fourths inch in height. The identification markings shall be placed on record with the JCIBPC. Ink of any color but black or white shall be used for printing logos and centering marks. Where bags are

fabricated by manufacturers other than the supplier of basic fabric or their subcontractor, the fabricator's name or trademark shall appear on each pattern in addition to the fabric manufacturer's name or trademark. The bag fabricator, when other than the fabric manufacturer, shall register the name or trademark with the JCIBPC.

**2.2.4.10. Inspection and Certification Requirements:**

**2.2.4.10.1. Responsibility for Inspection:** The fabric manufacturer and the supplier are both responsible for performance of all inspection requirements as specified herein. They may use their own or any other facilities suitable for the performance of such inspection requirements, unless such facilities are disapproved by the JCIBPC.

**2.2.4.10.2. Right to Perform Inspection or Testing:** Reasonable inspection or tests deemed necessary may be performed by the JCIBPC to assure that materials conform to prescribed specifications.

**2.2.4.10.3. Inspection or Testing Expense:** Expense for such inspection or testing shall be borne by the fabric manufacturer or supplier.

**2.2.4.10.4. Certification Required by the JCIBPC:**

**2.2.4.10.4.1. Submission of Samples:** All manufacturers of polypropylene must submit samples to a private testing laboratory selected by the JCIBPC for certification that materials meet all prescribed specifications.

**2.2.4.10.4.2. Approved List:** Upon receipt of testing results, the JCIBPC will publicize throughout the cotton industry a list of approved manufacturers and their trademarks.

**2.2.4.10.4.3. Responsibility for Components and Materials:** The fabric manufacturers shall be responsible for insuring that fabrics are manufactured, examined and tested in accordance with approved specifications and standards. The bag manufacturers shall be responsible for insuring that specifications for seams, cutting and sizes are met.

**2.2.4.10.4.4. Certification of Fabric Furnished:** Fabric manufacturers shall certify to customers that the fabric furnished has been manufactured in a NAFTA country from yarn and resins produced in a NAFTA country for use as cotton bale covers, and meets the material specifications herein, and that the manufacturer is on the JCIBPC's approved list.

**2.2.4.11. Test Methods:**

**2.2.4.11.1. Sample Size:** Polypropylene material selected for testing will consist of a minimum of ten randomly selected panels or spiral sewn bags or an equivalent amount of flat goods in cases where the material is tested before it is in sewn form.

**2.2.4.11.2. Length:** The length of the sample will be measured directly using a suitably graduated device. The sample will be laid out flat on a smooth horizontal surface and the length measured along both selvages for panels and along both sides for bags. The length of the sample will be the average of the two measurements rounded to the nearest inch.

**2.2.4.11.3. Width:** The width of the sample will be measured directly using a suitably graduated device and will include any selvages. The sample will be laid out flat on a smooth horizontal surface and the measurements made perpendicular to the lengths (selvages in the case of panels). Three width measurements will be taken on each sample. One measurement will be made at the center of the sample and two other measurements will be made approximately 12 inches in from each end of the sample. The average of the three measurements, rounded to the nearest inch, will be the width.

**2.2.4.11.4. Warp Yarn Count:** The number of warp ends in a 12-inch width of the sample will be counted. This figure will be divided by 12 to determine the warp yarns per inch.

**2.2.4.11.5. Weft Yarn Count:** The number of weft ends in a 12-inch length of the sample will be counted. This figure will be divided by 12 to determine the weft yarns per inch.

**2.2.4.11.6. Yarn Dimensions:** Polypropylene yarn dimensions will be tested as specified in ASTM D3218.

**2.2.4.11.7. Inhibitor Concentration:** For yarns stabilized by HALS, yarns shall be analyzed for inhibitor concentration as specified in Ciba-Geigy Corporation's analytical methods ADD-297 liquid chromatography and ADD-343 gel permeation chromatography. Specimen yarns shall likewise be removed from the weft or fill direction and tested for inhibitor concentration. Material containing an approved HALS or an equivalent (Section 2.2.4.2.3) shall result in a test value of no less than 0.3 percent HALS by weight. Material containing two approved HALS (Section 2.2.4.2.3) combined at known and consistent concentrations shall result in a combined test value of no less than 0.3 percent HALS by weight. The known and consistent concentrations of each combined HALS shall be placed on record with

the JCIBPC. Values obtained of less than the required concentrations in either warp or weft directions of the fabric shall be deemed non-conformance and constitute failure of this test.

**2.2.4.11.8. Trace Element:** For yarns stabilized by HALS, yarn shall be removed from the warp direction of each test sample and analyzed for the barium sulfate identification concentration by following applicable analytical test procedures as specified in ASTM D6247. Specimen yarns shall likewise be removed from the weft or fill direction and tested for identification concentration. Values obtained of less than 0.05 percent barium, as metal for the trace element in warp and/or weft directions of the fabric shall be deemed non-conformance and constitute failure of this test.

**2.2.4.11.9. Fabric Weight:** The fabric weight per square yard shall be determined using Federal Test Method Standard No. 191A, method 5041.

**2.2.4.11.10. Tensile Strength and Elongation:** A minimum of ten randomly selected samples will be tested for tensile strength and elongation to break at standard conditions and in accordance with Federal Test Method Standard No. 191A.

**2.2.4.11.11. Accelerated Weathering:**

**2.2.4.11.11.1. Preparation of Specimens:** The sample unit will be one finished panel or spiral sewn bag or an equivalent amount of flat goods. Three swatches 4 x 12 inches shall be cut from each principal direction (warp and weft) of the fabric. Each swatch shall be cut into two 4 x 6 inch test specimens: one specimen to be used for initial break strength and the other specimen to be used for break strength after accelerated weathering. The specimens shall be marked to indicate which are cut with the long dimension in the warp direction and which have the long dimension in the weft direction.

**2.2.4.11.11.2. Initial Tensile Breaking Strength:** The marked control specimens shall be conditioned for 24 hours at the standard condition specified in Federal Test Method Standard No. 191A and shall be tested for breaking strength in accordance with Federal Test Method Standard No. 191A, method 5100. The result shall be averaged for specimens in warp direction and averaged for specimens in weft direction and these averages shall be recorded as the initial breaking strength in warp and weft directions. For all fabric constructions, an average in warp of less than 125 pounds or less than 90 pounds in the weft direction shall constitute failure of this test.

**2.2.4.11.11.3. Accelerated Weathering Methods:** The balance of the specimens shall be tested in accordance with either of the following methods.

**2.2.4.11.11.3.1. Carbon Arc Testing:** Carbon arc testing shall be performed utilizing Federal Test Method Standard No. 191A, method 5804 for not less than 1,200 hours, except that the black panel temperature shall be maintained at 155 degrees Fahrenheit (F), plus or minus 3 degrees F. The black panel temperature shall be read during the final 10 minutes of a cycle just before the water spray period starts.

**2.2.4.11.11.3.2. Xenon Arc Testing:** Xenon arc testing shall be performed utilizing ASTM G155 for not less than 1,200 hours.

**2.2.4.11.11.4. Breaking Tensile Strength after Accelerated Weathering:** At the completion of 1,200 hours exposure to accelerated weathering, the specimens shall be conditioned for 24 hours at the standard conditions specified in Federal Test Method Standard No. 191A. After conditioning, the exposed specimens shall be tested for breaking strength in accordance with Federal Test Method Standard No. 191A, method 5100. An average breaking strength of less than 70 percent of the initial average breaking strength for its respective warp or weft yarn direction shall constitute failure of this test.

**2.2.4.11.12. Ends of Heat Cut Sheets and/or Spiral Sewn Bags:** Heat cut ends of cotton bale cover sheets and spiral tubing shall be evaluated for heat cut strength as specified in ASTM Method D 751. Pin test values of less than 40 pounds, as per this method, shall constitute failure of this test.

**2.2.4.11.13. Air Permeability:** The non-extrusion coated fabric shall be tested for air permeability as specified in ASTM D737-75. Air permeability values of less than 5 or more than 50 cubic feet per minute per square foot will constitute failure of this test.

**2.2.5. Polyethylene Woven Bagging:**

**2.2.5.1. General:** Polyethylene material used to wrap bales shall be new polyethylene fabric manufactured in a NAFTA country from yarn and resins produced in a NAFTA country and woven specifically for use on cotton bales. The bale covers shall be uniform in size and color, clean, unstained, and free of any extraneous material.

**2.2.5.2. Yarns:**

**2.2.5.2.1. Type:** The yarn shall be 100% high-density homopolymer polyethylene.

**2.2.5.2.2. Dimension:** For fabric constructions of 9 warp yarns per inch and 5.8 weft yarns per inch, warp yarn dimensions shall be 1.7 mils thick, plus or minus 0.1 mil and 98 mils wide, plus or minus 10 mils, with a linear density of 935 denier, plus or minus 55 denier. Filling yarn dimensions shall be not less than 1.8 mils thick, plus or minus 0.1 mil and 148 mils wide, plus or minus 10 mils, with a linear density of 1260 denier, plus or minus 90 denier.

**2.2.5.2.3. Inhibitor Concentration:** For yarns stabilized with a hindered amine light stabilizer (HALS), the yarn shall contain one or a combination of Tinuvin 622 LD and Chimassorb 944 from Ciba-Geigy Corporation or other equivalent HALS at a total concentration of not less than 0.032 percent weight of active inhibitor. The known and consistent concentrations of each combined HALS shall be placed on record with the JCIBPC.

**2.2.5.2.4. Trace Element:** The yarn must contain a trace element of vanadium at a concentration of not less than 0.0001 percent by weight which must be detectable after weathering for identification purposes. The JCIBPC will have samples checked periodically by a private laboratory at manufacturers' expense.

**2.2.5.3. Fabric Woven from Stabilized Yarns:**

**2.2.5.3.1. Fabric Count:** For 9 x 5.8 constructions, there must be an average of 9 warp yarns per inch and an average of 5.8 weft yarns per inch. No test sample shall contain less than 8 warp yarns or 5 weft yarns per inch.

**2.2.5.3.2. Minimum Weight:** For 9 x 5.8 fabric constructions, the extrusion coated fabric must weigh an average of not less than 2.7 ounces per square yard and no test sample shall weigh less than 2.5 ounces per square yard.

**2.2.5.3.3. Color:** The color of the uncoated fabric containing HALS shall be translucent natural unless otherwise approved by the JCIBPC.

**2.2.5.3.4. Tensile Strength:** Tensile strength of all coated fabrics shall be 110 pounds per inch average in the warp direction and 100 pounds per inch average in the weft direction. Ten samples shall be tested in each direction for this determination and no single test shall be more than 20 pounds per inch below the specified average.

**2.2.5.3.5. Elongation:** The fabric shall have an elongation to break of not less than 15 percent average in both warp and weft directions. Ten samples shall be tested in each direction for this determination and no single test value shall be below 12 percent.

**2.2.5.3.6. Selvage and Ends:** Each outer edge of the fabric shall be tucked selvage or natural selvage containing not less than the number of weft ends prevalent in the body of the fabric. A heat cut selvage will not be acceptable. Ends of spiral-sewn bags must be finished by heat cutting to give a pin test value of at least 40 pounds.

**2.2.5.3.7. Air Permeability:** The non-extrusion coated fabric in an unstressed state must permit not less than 5 cubic feet per minute per square foot, nor more than 50 cubic feet per minute per square foot of air flow.

**2.2.5.3.8. Weathering Resistance:** The fabric shall retain not less than 70 percent of its original tensile breaking strength after 1,200 hours exposure to accelerated weathering.

**2.2.5.4. Coatings:** Any coating added to the fabric to reduce gloss, fibrillation, slippage, or for other technical reasons, shall be as stable as the fabric to which it has been applied when exposed to accelerated weathering and low temperatures. Such coating must not adversely affect cotton, which it is to contact. Polyolefin coating added to prevent fibrillation must be thermally bonded to woven polyethylene fabric by extrusion coating at a minimum thickness at any point of 0.75 mil. Coating must not delaminate during stresses of baling and compression.

**2.2.5.5. Fully-Coated Gussetted Spiral Sewn Bags Used to Wrap Gin Standard and Gin Universal Density Bales:**

**2.2.5.5.1. Material:** Fabric shall conform to the specifications for the 9 x 5.8 fabric construction meeting applicable requirements in Sections 2.2.5.1 through 2.2.5.4, 2.2.5.6 and 2.2.5.7.

**2.2.5.5.2. Fabric Width:** The fabric from which each bag is sewn shall be a minimum of 60 inches in width.

**2.2.5.5.3. Bag Size:** The bag size must be tailored to individual bale size at each location. Bags shall fit bales tightly, but must be large enough to slip down for sampling and minimize bursting and long enough to completely cover and secure heads of bales. The gussets shall be of equal width, plus or minus 1 inch. The minimum finished bag length shall be not less than 85 inches.

**2.2.5.5.4. Seams:** Seams must be sewn in accordance with the following: Type SSn-1 (folded), type 401 stitch, minimum 3.5 stitches per inch, and 4/12 or 5/12 cotton thread, or a polypropylene thread with an approximate yarn denier of 1,000, meeting ultraviolet light inhibitor concentration and

identification concentration requirements of Section 2.2.5.2.3, with a minimum tensile strength of 11.02 pounds. Sewn seams at bottom of bags must be a minimum of three-fourths inch from heat cut edges and be of type SSn-1 (folded). Color of polypropylene sewing thread shall meet color requirements of Section 2.2.5.3.3.

**2.2.5.5.5. Coating:** Coating shall meet requirements of Section 2.2.5.4 and shall be applied across the entire width of the flat fabric. Coating must be located within 0.5 inches plus or minus 0.25 inches of the selvage edge.

**2.2.5.5.6. Venting:** The bag shall be adequately vented without impairing the integrity of the bag.

**2.2.5.6. Identification Markings:** Each sewn bag must have the name or trademark of the fabric manufacturer (that is, the company weaving the material) and the appropriate yarn denier (880 x 1170) and construction (9 x 5.8) suitably printed no more than 36 inches apart in the center of each bag. Each identification mark shall be at least three-fourths inch in height. The identification markings shall be placed on record with the JCIBPC. Ink of any color but black or white shall be used for printing logos and centering marks. Where bags are fabricated by manufacturers other than the supplier of basic fabric or their subcontractor, the fabricator's name or trademark shall appear on each pattern in addition to the fabric manufacturer's name or trademark. The bag fabricator, when other than the fabric manufacturer, shall register the name or trademark with the JCIBPC**.**

**2.2.5.7. Inspection and Certification Requirements:**

**2.2.5.7.1. Responsibility for Inspection:** The fabric manufacturer and the supplier are both responsible for performance of all inspection requirements as specified herein. They may use their own or any other facilities suitable for the performance of such inspection requirements, unless such facilities are disapproved by the JCIBPC.

**2.2.5.7.2. Right to Perform Inspection or Testing:** Reasonable inspection or tests deemed necessary may be performed by the JCIBPC to assure that materials conform to prescribed specifications.

**2.2.5.7.3. Inspection or Testing Expense:** Expense for such inspection or testing shall be borne by the fabric manufacturer or supplier.

**2.2.5.7.4. Certification Required by the JCIBPC:**

**2.2.5.7.4.1. Submission of Samples:** All manufacturers of polyethylene must submit samples to a private testing laboratory selected by the JCIBPC for certification that materials meet all prescribed specifications.

**2.2.5.7.4.2. Approved List:** Upon receipt of testing results, the JCIBPC will publicize throughout the cotton industry a list of approved manufacturers and their trademarks.

**2.2.5.7.4.3. Responsibility for Components and Materials:** The fabric manufacturers shall be responsible for insuring that fabrics are manufactured, examined and tested in accordance with approved specifications and standards. The bag manufacturers shall be responsible for insuring that specifications for seams, cutting and sizes are met.

**2.2.5.7.4.4. Certification of Fabric Furnished:** Fabric manufacturers shall certify to customers that the fabric furnished has been manufactured in a NAFTA country from yarn and resins produced in a NAFTA country for use as cotton bale covers, and meets the material specifications herein, and that the manufacturer is on the JCIBPC's approved list.

**2.2.5.8. Test Methods:**

**2.2.5.8.1. Sample Size:** Polyethylene material selected for testing will consist of a minimum of ten randomly selected spiral sewn bags or an equivalent amount of flat goods in cases where the material is tested before it is in sewn form.

**2.2.5.8.2. Length:** The length of the sample will be measured directly using a suitably graduated device. The sample will be laid out flat on a smooth horizontal surface and the length measured along both sides of the bags. The length of the sample will be the average of the two measurements rounded to the nearest inch.

**2.2.5.8.3. Width:** The width of the sample will be measured directly using a suitably graduated device and will include any selvages. The sample will be laid out flat on a smooth horizontal surface and the measurements made perpendicular to the lengths. Three width measurements will be taken on each sample. One measurement will be made at the center of the sample and two other measurements will be made approximately 12 inches in from each end of the sample. The average of the three measurements, rounded to the nearest inch, will be the width.

**2.2.5.8.4. Warp Yarn Count:** The number of warp ends in a 12-inch width of the sample will be

counted. This figure will be divided by 12 to determine the warp yarns per inch.

**2.2.5.8.5. Weft Yarn Count:** The number of weft ends in a 12-inch length of the sample will be counted. This figure will be divided by 12 to determine the weft yarns per inch.

**2.2.5.8.6. Yarn Dimensions:** Polyethylene yarn dimensions will be tested as specified in ASTM D3218.

**2.2.5.8.7. Inhibitor Concentration:** Yarn shall be removed from the warp and weft directions of each test sample and analyzed for the HALS ultraviolet light inhibitor concentration as specified in Ciba-Geigy Corporation's analytical methods ADD-297 liquid chromatography and ADD-343 gel permeation chromatography. Material containing one approved HALS (Section 2.2.5.2.3) shall result in a test value of no less than 0.032 percent HALS by weight. Material containing two approved HALS (Section 2.2.5.2.3) combined at known and consistent concentrations, shall result in a combined test value of no less than 0.032 percent HALS by weight. The known and consistent concentrations of each combined HALS shall be placed on record with the JCIBPC. Values obtained of less than the required concentrations in either warp or weft directions of the fabric shall be deemed non-conformance and constitute failure of this test.

**2.2.5.8.8. Trace Element:** Yarn shall be removed from the warp and weft directions of each test sample and analyzed for the vanadium identification concentration by neutron activation. Specimen yarns shall likewise be removed from the weft or fill direction and tested for identification concentration. Values obtained of less than 0.0001 percent vanadium, as metal for the inhibitor in warp and/or weft directions of the fabric shall be deemed non-conformance and constitute failure of this test.

**2.2.5.8.9. Fabric Weight:** The fabric weight per square yard shall be determined using Federal Test Method Standard No. 191A, method 5041.

**2.2.5.8.10. Tensile Strength and Elongation:** A minimum of ten randomly selected samples will be tested for tensile strength and elongation to break at standard conditions and in accordance with Federal Test Method Standard No. 191A.

**2.2.5.8.11. Accelerated Weathering:**

**2.2.5.8.11.1. Preparation of Specimens:** The sample unit will be one finished panel or spiral sewn bag or an equivalent amount of flat goods. Three swatches 4 x 12 inches shall be cut from each principal direction (warp and weft) of the fabric. Each swatch shall be cut into two 4 x 6 inch test specimens: one specimen to be used for initial break strength and the other specimen to be used for break strength after accelerated weathering. The specimens shall be marked to indicate which are cut with the long dimension in the warp direction and which have the long dimension in the weft direction.

**2.2.5.8.11.2. Initial Tensile Breaking Strength:** The marked control specimens shall be conditioned for 24 hours at the standard condition specified in Federal Test Method Standard No. 191A and shall be tested for breaking strength in accordance with Federal Test Method Standard No. 191A, method 5100. The result shall be averaged for specimens in warp direction and averaged for specimens in weft direction and these averages shall be recorded as the initial breaking strength in warp and weft directions. For all fabric constructions, an average in warp of less than 110 pounds or less than 105 pounds in the weft direction shall constitute failure of this test.

**2.2.5.8.11.3. Accelerated Weathering Methods:** The balance of the specimens shall be tested in accordance with either of the following methods.

**2.2.5.8.11.3.1. Carbon Arc Testing:** Carbon arc testing shall be performed utilizing Federal Test Method Standard No. 191A, method 5804 for not less than 1,200 hours, except that the black panel temperature shall be maintained at 155 degrees Fahrenheit (F), plus or minus 3 degrees F. The black panel temperature shall be read during the final 10 minutes of a cycle just before the water spray period starts.

**2.2.5.8.11.3.2. Xenon Arc Testing:** Xenon arc testing shall be performed utilizing ASTM G155 for not less than 1,200 hours.

**2.2.5.8.11.4. Breaking Tensile Strength after Accelerated Weathering:** At the completion of 1,200 hours exposure to accelerated weathering, the specimens shall be conditioned for 24 hours at the standard conditions specified in Federal Test Method Standard No. 191A. After conditioning, the exposed specimens shall be tested for breaking strength in accordance with Federal Test Method Standard No. 191A, method 5100. An average breaking strength of less than 70 percent of the initial average breaking strength for its respective warp or weft yarn direction shall constitute failure of this test.

**2.2.5.8.12. Ends of Heat Cut Sheets and/or Spiral Sewn Bags:** Heat cut ends of cotton bale cover sheets and spiral tubing shall be evaluated for heat cut strength as specified in ASTM Method D751.

Pin test values of less than 40 pounds, as per this method, shall constitute failure of this test.

**2.2.5.8.13. Air Permeability:** The non-extrusion coated fabric shall be tested for air permeability as specified in ASTM D737-75. Air permeability values of less than 5 or more than 50 cubic feet per minute per square foot will constitute failure of this test.

## 3. OFFICIAL TARE WEIGHTS

**3.1. Tare Weights:** The following table shows official tare weights for various combinations of approved wrapping materials.

| OFFICIAL TARE WEIGHTS IN POUNDS FOR 2005 - 2005 CROP | | | | | | |
|---|---|---|---|---|---|---|
| **Wrapping Materials** | **Bale Ties[1]** | | | | | |
| | Polyester (6-Strap) Plastic Strapping [Approved or Experimental] | 10 gauge automatically applied galvanized wire (6-Wire) | Controlled-Slip Steel Strapping (6-Strap) or Other 6-Wire | All 8-Wire | Controlled Slip Steel Strapping (8-Strap) | Fixed Seal Steel Strapping |
| Woven Polypropylene [Approved or Experimental][2] Woven Polyethylene[3] | 2 | 4 | 4 | 5 | 5 | 6 |
| Linear Low Density Polyethylene Film[4] Non-woven Cotton Bagging [Experimental][5] | 3 | 4 | 5 | 5 | 6 | 7 |
| Burlap Spiral Bagging, Cotton Bagging[6] | 4 | 6 | 6 | 7 | 7 | 8 |

[1] Wire or strapping includes all high tensile steel strapping, wire or polyester strapping and must meet all applicable requirements in Sections 1.1. Cold Rolled High Tensile Steel Strapping must also meet all requirements in Section 1.2.1. Wire ties must also meet all requirements in Section 1.2.2. Polyester strapping can be identified by its translucent or opaque green color. Such approved polyester materials must also meet all requirements in Section 1.2.3.

[2] Woven polypropylene can be identified by its pale yellow or white color. This category includes all patterns of polypropylene including bag and sheet combinations and spiral sewn bags. Such approved material must meet all other requirements in Section 2.2.4.

[3] Woven polyethylene can be identified by its clear bag color with a white random coating or its white solid coating. Such approved material must meet all other requirements in Section 2.2.5.

[4] Linear low density or tri-extruded polyethylene film bags can be identified by the clear, light yellow, or light brown color and the words "100% linear low density polyethylene" or "100% LLDPE" or "tri-extruded" printed on each bag. Such material must meet all other applicable requirements in Section 2.2.3.

[5] Non-woven cotton bagging is an experimental needle punched cotton bale bag.

[6] Burlap spiral sewn bags can be identified by the manufacturer code, the importer code, and the wording "10 oz/ 40 in" printed on each bag. Cotton bagging is any other knitted or woven cotton package material made from all cotton fibers. Burlap or cotton bagging must meet all other requirements for that type of bagging set forth in Sections 2.2.1 or 2.2.2.