A BRIEF WORD ABOUT OUR COMPANY . . .

Samuel Jackson’s Lubbock, Texas Factory and Offices

“Cotton conditioning” and “Samuel Jackson” have been synonomous words for half a century. There is no other company in the world with a greater passion for exploring the effects of moisture as it relates to cotton fiber, developing products to use these effects, and bringing these products to commercial application for the cotton industry.

Engineers devoted to discovery of new and better techniques of conditioning fiber for maximum value have many tools to assist them, most important of which is their home location in the heart of the largest cotton producing region of the world.

Our manufacturing facility handles all of our metal forming and assembly operations. This permits creative designers to pursue conditioning techniques uninhibited by limitations of off-the-shelf devices. Some of our manufacturing personnel have been with us more than 30 years and their craftsmanship is well-known in a number of different industries.

Our small, family owned and operated enterprise is working in most cotton producing regions of the world and welcomes new challenges and the friendships that come from meeting special needs.

From the company that brought humid air to the cotton gin first, we welcome you to this view of our newest product line.
HUMIDAIRE UNITS - GAS-FIRED / OIL-FIRED

Background and Purpose of the Humidaire Unit

The Samuel Jackson Humidaire Unit generates warm humid air which carries water vapor to cotton fibers in a form which is quickly and uniformly absorbed. Samuel Jackson Humidaire Units have been in extensive use since 1959.

Both gas-fired and oil-fired models are available.

Humid air can be applied at various places in the gin plant. Humid air applied to lint just before the bale press reduces the force required to press out uniform bales and increases lint turn out.

Humid air applied to the cotton just before the gin stand restores moisture to dry and brittle fiber before fiber-seed separation. This reduces short fiber generated by the gin saws. In very dry climates, humid air applied to seed cotton during pre-cleaning reduces static electricity problems that impede cotton flow.

A Unique Mixture of Fire and Water

Air is drawn into the Humidaire Unit and around a burner head that heats the air. This hot air enters a stainless steel water spray chamber. In the spray chamber, the hot air is scrubbed, cooled and humidified by a large volume of water circulated through stainless spray nozzles by a 5 HP pump.

Zig-zag mist eliminator baffles at the top of the spray chamber allow humid air to leave while retaining water droplets. An external fan (not included) transfers the warm humid air to the place in the gin where it is applied to the cotton. As the water is evaporated from the tank, a float valve refills the tank. A conductivity control system constantly monitors this remaining water and operates a purge/refill cycle to keep the water fresh for low maintenance.

Adjustment of the relative humidity of air from the Humidaire Unit controls the amount of moisture applied to the lint. Relative humidity is controlled with two digital temperature controllers that give the operator independent control of dry-bulb and wet-bulb temperatures. The closer these two temperatures are together, the higher the relative humidity.

One controller regulates the burner fuel valve to control the air temperature. The other controller regulates a stainless butterfly valve for throttling water flow to the spray nozzles. Water flow through the nozzles controls the water temperature.
Operator Controls

Operator controls are simple and dependable. They can be installed at the ginner's console or at the press control console. A box is available for mounting them elsewhere. Selector switches turn on the burner and enable the water pump. The water pump starts to run only if the 14900A Lint Flue Scanner or other control indicates that cotton is present. Pilot lights verify that the burner and water pump are operating.

The 20500 Dual Digital Control allows precise, independent control of the air and water temperatures. This allows the ginner to obtain the desired levels of fiber moisture while eliminating most condensation problems at night or in cold weather. The closer the two temperatures are together, the higher the relative humidity. Each controller shows the desired temperature (SP) and the actual measured temperature. This makes troubleshooting easy. Two alphanumeric displays (at remote and main panel) simultaneously display operation statistics, error history, and alarm notices for remote or local acknowledgement.

Electrical Controls and Fuel Valves

Electrical controls are in the gasketed top compartment of the cabinet. A microprocessor handles combustion controls, diagnostics, and automatic self-test routines. Diagnostics include automatic gas valve leak testing, automatic testing of electrical interlocks, and monitoring of the water system (water tank level, pump rotation, overload relay, scanner adjustment, and conductivity control adjustment).

The gas valves are located in the lower cabinet. The modulating valve with its actuator closes tightly when power is removed. The gas train, though simple, provides double block for safe, dependable shutoff.
Secret to High Performance – A Samuel Jackson Water Valve and Burner

Water flow and pressure to the spray nozzles is controlled with a stainless steel butterfly valve. Water pressure before and after the valve is shown on pressure gages.

Should the flow of air be choked and other safety controls fail to function, the dual high temperature probes, located above the burner and in the spray chamber, will shut the unit off.

A heat shield inside the burner duct helps direct heat effectively while protecting outer surfaces from the flame. Cooling air for the heat shield comes through the four holes pictured.

A large panel door on the spray chamber front (not pictured) provides easy access to the water tank screen, spray nozzles and zig-zag mist eliminator.

Adjustable four-piece shutters form an aperture to restrict the flow area ahead of the burner to maintain a high velocity of air across the burner head for good combustion. (In the picture, the stainless mesh air inlet screen is removed to show the shutters and the burner head.)

The burner orifice is easy to change to adapt to different fuels (natural gas or LPG) and to different maximum outputs. The burner can modulate from the maximum output down to 1/20 (20 to 1 turn-down ratio) of maximum output.
A Machine That Takes Care of Itself

A digital water conductivity monitoring and control system prevents scale formation inside the spray chamber, nozzles, pump and circulation pipes. This feature contributes greatly to trouble-free operation and long life of the unit. This will prevent excessive scale formation in the spray chamber of the unit. Purge valve operation is monitored and a special diagnostic alerts the operator if a problem occurs in purging.

TRU-Temperature logic (Timed Response Under-Temperature) lets the ginner know when water temperature is inadequate. Clogged water nozzles, among other common maintenance oversights, contribute to low water temperature. The degree of sensitivity may be set by gin management and electronically locked if desired.

Positive pressure or gravity drainage systems can be accommodated. This allows drainage or purging of used water to an elevated storage tank if needed. The worm gear connection to the valve will fit a standard garden hose to send purge water anywhere it is needed.

Stainless steel is used for the water tank, spray chamber, spray nozzles, water pipes, mist eliminator, water and air screens, discharge hood and burner duct to provide long life and attractive appearance.

The optional 16920 Hot Air Valve is available for humid air applications with special battery condensers where a source of hot dry air is needed for drying the condenser screen and rollers. This hot dry air can also be used for heating surfaces on the lint slide where condensation is a problem.

Heated air is pulled through the valve from the burner duct before the spray chamber by an external fan (not included). The mix valve controls the amount of hot air mixed with ambient air to maintain the desired dry air temperatures. This valve comes with an electric actuator and digital temperature control.
The Moisture Mirror brings together a number of existing Samuel Jackson products and coordinates the interaction of new sensors and functions to make moisture control easier and more intuitive for the operator. Screens are easy to navigate with help screens always just one touch away.

The Moisture Mirror is designed to easily accept signals from Samuel Jackson sensors and controls. It is also easy to connect sensors from many other manufacturers that have compatible signals. Take a look at the Moisture Mirror's "can do" list!

- Incoming cotton moisture sensors can be connected to automatically set appropriate drying system temperatures faster than a human operator can respond. This lets a ginner use lower temperature drying without worrying about surprises. The operator touches the screen to increase or decrease the color bar to fine tune the control to his operating preferences. A user programmable electrical contact is available to signal other devices when wet cotton enters the gin.

- When a Samuel Jackson Steamroller System is connected, final bale moisture can be automatically controlled with great precision. An embedded sensor option in the Steamroller makes this tight feedback control possible. The operator sets the “Target Moisture” and The Mirror handles the rest!

- Brilliant yellow bar graphs show the operator mass flow of seed cotton from the module feeder and the precleaning system when a Samuel Jackson Flow Analyzer is connected to the Mirror. Keep The Mirror close to your module feeder controls, your operator will not want to be without it!

- Seed cotton moisture after the drying system (located in the overflow hopper) is actively displayed on its own screen and on the summary screen when the Mirror is connected to a Samuel Jackson (or compatible) after-drying moisture sensor.

- The product would not be complete without letting you view its work. An X-Y graphical plot shows you the past 24 hours of moisture history including incoming seed cotton moisture, after-drying moisture, and final bale moisture.
The Steamroller Lint Conditioning System is the most powerful moisture restoration device for lint cotton in the world.

- More than 4.1 million bales have had moisture restored with Steamrollers since its invention in late 1996. Ideas from users and designers have been added to further enhance operation.

- Growers enjoy a big turnout increase.

- Ginners enjoy pressing a 500 pound bale with no effort. Reduced power consumption and maintenance for the press are nice economic side effects. A 40% reduction in hydraulic pressure to press a bale is not unusual. Automatic tying systems work faster and easier.

- Bale tie breakage is eliminated when the bales are pressed with high levels of moisture, even 6-tie systems.

- The Steamroller handles moisture restoration without moist air in the battery condenser. The condenser remains free to do the job it does best, without condensation and hairing on its drum.
Moist air, generated by a Samuel Jackson Humidaire Unit, completely penetrates the cotton batt inside the Steamroller. The cotton batt is compressed, upon leaving the Steamroller, into a blanket of cotton. This thin uniformly conditioned cotton flows down to the lint slide.

Unlike a dry fluffy batt, a compressed batt increases the slide capacity and is easier to charge into the press. High capacity fast, dog-less presses require a conditioned batt to press. Without adequate moisture, the cotton will bloom out of the press box during box rotation.

The Steamroller efficiently forces all of the moist air through the cotton, saving fuel and money in operating the Humidaire Unit.

An optional moisture sensor is available to measure the moisture content of the cotton batt flowing out of the Steamroller. The cotton is pressed onto the moisture sensor by the doffer/compression roller.

The Steamroller’s control system comes with everything required to let it track effortlessly with the battery condenser’s drive. The control system allows the ability to easily fine tune the Steamroller’s cotton drafting action from the battery condenser for optimal performance.

Please contact us for more information on the benefits of moisturizing lint cotton with the Steamroller Lint Conditioning System.
Typical Steamroller Lint Conditioning System Layout
The Lint Slide Grid

The Lint Slide Grid is used to humidify cotton as it passes down the lint slide to the baling press. It is composed of stainless steel crosspieces (slats) which overlap to form louver-like openings. Humid air, introduced through the floor of the lint slide beneath the grid, issues from these openings and passes upward through the batt of cotton, adding moisture to it. The overlapping arrangement of the slats helps to push the cotton down the slide as the cotton floats on this bed of humid air and prevents the accumulation of pin trash beneath the grid. The Lint Slide Grid is an exclusive product with us and is the best and most economical method of humidifying the lint in most gins. We invented it in 1976 to replace the prior method of putting humid air in the battery condenser, which caused problems with hairing the condenser screen.
HUMIDIFICATION

OPTION A. INSULATE EXTERIOR LINT SLIDE SIDES WITH 1” POLYSTYRENE BOARD INSULATION.

OPTION B. A SAMUEL JACKSON HOT AIR VALVE CAN BE USED TO APPLY HOT AIR TO THE BOTTOM OF THE LINT SLIDE TO PREVENT CONDENSATION.

OPTION C. INSTALLING A 1/8 THICK LHW LINER ALONG THE INSIDE WALLS OF THE LINT SLIDE KEEPS SIDES CLEAN AND PROVIDES INSULATION. BOTTOM EDGE OF LINER SHOULD BE 1/4” ABOVE GRID SLATS.

OPTION D. USED HUMID AIR CAN BE PUT INTO THE LINT FLUE RISER OR IT CAN BE VENTED OUTSIDE USING A SEPARATE FAN AS ANOTHER OPTION. THIS USED HUMID AIR CAN BE BLOWN INTO THE CONVEYER DISTRIBUTOR AT THE COTTON ENTRANCE CHUTES TO KILL STATIC ELECTRICITY.

OPTION E. A VINYL STRIP CURTAIN AT THE TOP OF THE LINT SLIDE CAN BE USED FOR ENHANCED PROTECTION OF DOFFING ROLLERS FROM HUMID AIR.

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LINT SLIDE GRID OPTIONS AND ENHANCEMENTS

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Conditioning Hoppers

When cotton enters a gin too dry, no amount of downward adjustment in drying system temperature can protect the fiber from what happens at the gin stands without fiber protection. Even turning drying burners off will not stop the loss of staple and a sharp increase in short fiber content that occurs when saws take fiber from seed that is dry. For three decades, the Conditioning Hopper, used in conjunction with a Humidaire Unit, has protected fiber properties of cotton in arid regions of the world by humidifying seed cotton before the gin stand. No expensive chemicals are required to enjoy this staple increase and, as a bonus, static charge is eliminated.

Installed between the conveyor distributor and the feeder, the Conditioning Hopper works with the Humidaire Unit to expose the seedcotton to humid air before ginning. Longtime users of these hoppers report reduced short fiber content, increased staple length (typically 1/16), and reduced load on the gin stand. Conditioning Hoppers are available to fit most gin stand types and arrangements and, in many cases, can share a Humidaire Unit with the Lint Slide Grid. Double-entry hoppers are available for high capacity gin stands. The double-entry design permits more uniform conditioning in high capacity applications.
Samuel Jackson, Inc. announces its product line for 2002. The products listed are the result of precise engineering, quality manufacturing, and rigorous testing. Performance beyond expectations and strong technical support are the hidden ingredients of every member of our product family. The Samuel Jackson team looks forward to serving you with all of your cotton moisture control needs.

**HUMIDIFYING EQUIPMENT FOR COTTON GINS**

- **Humidaire Units** — Produce warm humid air to increase moisture content of cotton at the lint slide or below the conveyor distributor. All models prompt operator with helpful alphanumeric messages and remember the past 500 events to assist in troubleshooting and optimization. Independent water and air temperature controls provide dependable and precise regulation of output. Scale and buildup is virtually eliminated with pulsed purge system. Humidaires are available in gas-fired and oil-fired models.

- **Steamroller Lint Conditioner** — The newest technology in cotton moisture restoration. Designed for high capacity gins, the Steamroller efficiently moisturizes and compresses the cotton batt. Each system is custom engineered to ensure maximum performance.

- **Lint Slide Grids** — An economical method of applying humid air at the press for small to medium capacity gins. Available in packages that include piping, reclamation hood, fans, and tech support.

- **Conditioning Hoppers** — Installed below the conveyor distributor. Raises the cotton moisture content to protect the fibers from breakage by gin and lint cleaner saws, eliminates static, and increases effectiveness of moisture restoration systems at the press.

**DRYING EQUIPMENT FOR COTTON GINS**

- **Drying Systems** — We engineer drying systems and guarantee their performance. Samuel Jackson Drying Systems are known worldwide for handling the wettest and most demanding cotton drying applications. Pull-through operation without push fans, use of high air volumes with low air temperatures, and innovative methods of using hot air at the module feeder are characteristics of our cotton drying systems. Advanced touchscreen controls and moisture sensors keep temperatures appropriate for the incoming fiber, safely limited, and highly stable and controlled.

- **Heaters** — Samuel Jackson Heaters feature advanced combustion control and diagnostics with the same friendly features as our Humidaire Units. All heater models may be used with push fans or in pull-through systems. Each heater is factory tested and quality inspected; just part of why Samuel Jackson makes the most reliable heaters for cotton gins.
  - **Gas-fired Heaters** — 4 and 8 million Btu/hour sizes.
  - **Oil-fired Heaters** — 4 and 7 million Btu/hour sizes. Can be used on pressure side of push fans or in pull-through systems.

- **Hot Box II** — This version of the Hot Box fits over the discharge end of a module feeder belt and picks up the cotton in hot air from a separate pull-through heater. No push fan, vacuum feeder, or other motorized components are used. Communication with Samuel Jackson heaters is standard to insure peak operation and record operator actions.
NEW! **The Flail for Hot Box II** — Rotating chains at staggered intervals are mounted above a Hot Box II exit. These chains break wads and disperse stubborn, wet cotton to maximize drying effectiveness.

**Push Plenums for Gas-fired Heaters** — Used with push fan rotated to bottom horizontal discharge. Diffuses the air better so burner has improved turndown performance. Also places the burner at a more convenient height.

**MOISTURE MEASUREMENT AND MISCELLANEOUS CONTROL DEVICES**

NEW! **The Moisture Mirror System Coordinator** — Adjusts drying temperature automatically by measuring incoming seed cotton moisture. Measures and displays after-drying seed cotton moisture. Displays the flow rate and split of seed cotton coming into the gin from the module feeder. Measures final lint moisture on Steamrollers and adjusts the Humidaire Unit automatically to maintain the desired moisture. Provides a color graph of moisture information from the past 24 hours.

**“Sled” Moisture Sensor** — Device resembles a sled that rides on top of cotton on belt conveyor. Cotton moisture content is measured and sent to a Moisture Mirror (see above) for automatic control of drying system.

**Moisture Sensors for the Feed Control and Live Overflow** — These rugged resistance sensor assemblies come with a cotton moisture transmitter assembly to report seed cotton moisture information to the Moisture Mirror (see above). One is mounted inside the feed control bin and the other is mounted in the live overflow bin to accurately sense moisture following the drying process.

**High Temperature Limit Controls** — To limit hot air temperature for all Samuel Jackson burners.

**Flow Analyzer** — Displays volume of cotton flowing through pre-cleaning system. Useful for balancing load in a split stream precleaning arrangement or for advance visual indication of a cotton surge from the feeder. Requires Moisture Mirror (see above).

NEW! **The Water Watch Option** — Displays exact usage of water by a Samuel Jackson Humidaire Unit. Information includes real time values of makeup water and purge water. Also includes evaporation rate over the past 24 hours. Uses standard LCD display included on late model Samuel Jackson Humidaire Units (model HU-60-1255 or later).

**Cotton Moisture Meters** — Delmhorst hand-held moisture meters are available with module probe, seed cotton cup, and bale probe. Digital readout insures consistent readings.

**Electric Banjos** — These units mount on the fan inlets of either pull or push fans to provide full fan performance regardless of material loading or air temperature. They unload the fans automatically to provide “soft start” and then modulate smoothly to maintain desired motor load as the air system loading changes. Rugged construction provides excellent performance for drying system pull fans and prolongs fan life, even when used for trash duty applications.