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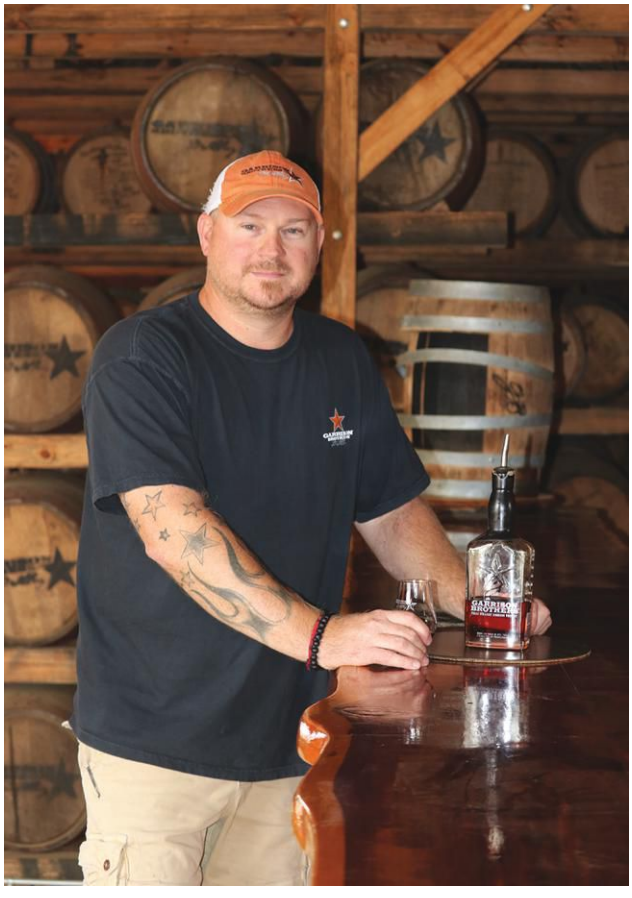
Top quality grain handling

Artisanal bourbon distillery supports its growth with Coperion K-Tron automated vacuum system for raw materials

The dedication of Garrison Brothers Distillery to produce artisanal bourbon in Hye, Texas, has resulted in an increase in popularity, substantial growth and a need to increase production.

The distillery prides itself on producing a unique wheated bourbon using the finest locally sourced and organic ingredients, some of which are grown right on the distillery property. Keeping true to that culture, Garrison Brothers expected no less from the system to supply those raw materials to the process.

In 2018, Garrison Brothers contacted Coperion K-Tron's local representative and resident grain handling expert, Robert Petrin of Shamrock Systems Inc., to help upgrade its system. Petrin turned to the system experts at Coperion K-Tron to help design a completely automated system that would enable Garrison Brothers to quadruple its production.



Donnis Todd, master distiller at Garrison Brothers, displays the company's top-shelf bourbon with Texas pride.

BUILDING A SEQUENCING SYSTEM

The Coperion K-Tron system uses vacuum sequencing to pull raw materials, such as corn, wheat or barley, from existing silos direct to a pneumatic receiver mounted above an existing hammer mill. Once the ingredients are milled to a precise particle size distribution, another vacuum line picks up the milled product and conveys it to one of several scale weigh hoppers.

The design engineers at Coperion K-Tron worked within an extremely tight technical space to make sure that the weigh hopper systems were ergonomically accessible but still optimized in position to continue to allow room for daily customer tours through the mash room.

The scale hoppers are all designed with specialty vacuum sequencing receiver filter

sections and sequencing valves, as well as fluidizing pads to keep the material fluid while discharging the weigh hoppers.

Multiscale weigh hoppers give added versatility for capacity and ingredient recipe changes. Once weighed, the raw materials are discharged via Coperion K-Tron rotary airlocks and then through specialty diverter valves into multiple screw conveyors that are directed to one of two 500 gallon kettles, or an additional 1,000 gallon kettle. The system is controlled by an overriding PLC control system, which allows a single operator to modify the recipe as needed and control the increased output from the mash kettles.

HOW VACUUM CONVEYING WORKS

Vacuum conveying is the process of moving bulk dry ingredients from the silos to within the mash room using suction. The material is transferred in a network of tubing from the silo pick up point to the hammer mill inlet, and then again from the outlet of the hammer mill to the scale hoppers.

Vacuum sequencing receivers can be designed for either "keep full" or "feeder refill" operation. Keep full receivers, including the one used by Garrison Brothers, are designed to keep the hopper below each receiver full. When the service cycle ends, the weight of the material inside the receiver causes the discharge gate to open. The receiver is either equipped with a level switch, as integral to the gravity discharge gate assembly, or a secondary level switch that is mounted in the hopper below the receiver.

When the gravity discharge gate is in the almost closed position or a signal from the secondary level indicator is detected, a call for material is established.

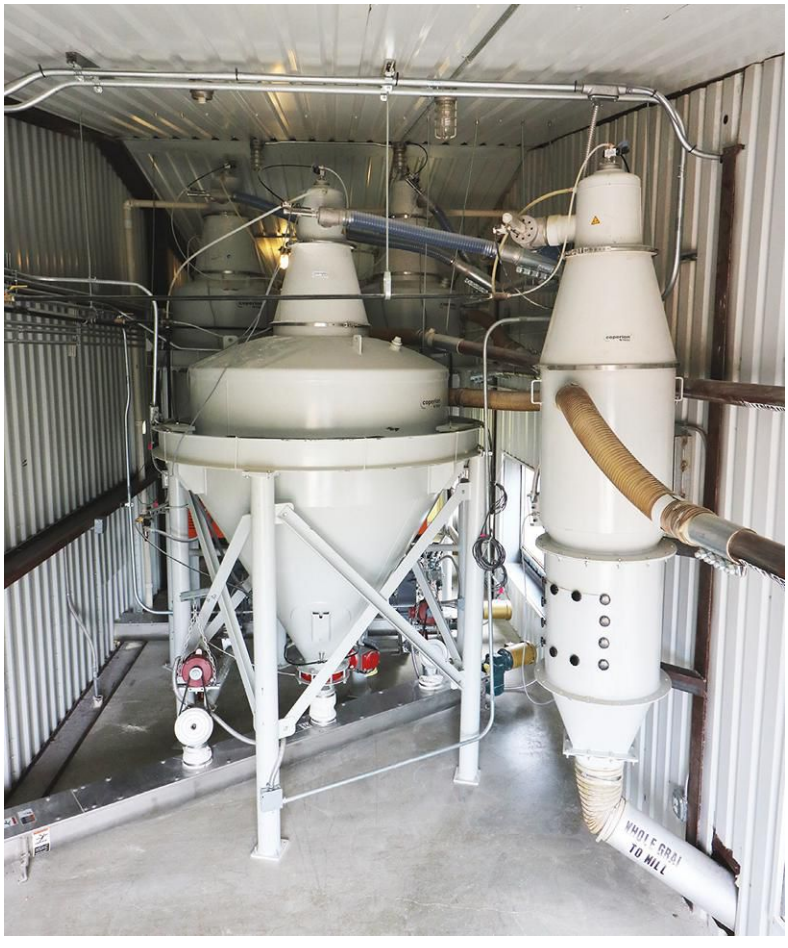


PHOTO COURTESY OF COPERION K-TRON

The Coperion K-Tron pneumatic receiver (right) pulls raw barley, wheat or corn from silos and delivers it to a hammer mill. Multiple modified scale weigh hoppers (left) receive the milled ingredients and provide necessary filtration, as well as versatility for capacity and ingredient recipe changes.

BATCH WEIGHING WITH SCALE HOPPERS

Scale hoppers are receiving hoppers suspended on load cells for ingredient batch weighing. A variety of systems are available for batch weighing of pneumatically conveyed food ingredients, whether the application requires a single ingredient to be delivered to multiple destinations or multiple ingredients to be delivered to a single destination.

WITH THE GRAIN HANDLING CONTROL SYSTEM, JUST ONE PERSON IS NEEDED TO OPERATE THE MASH ROOM.

The material resides in the scale hopper until the precise weight and/or combination of materials is achieved. With the scale weighing system, ingredient accuracies of +/- 0.5% of the full scale capacity can be expected. After accurate weighing, the process then calls for material, a butterfly valve opens and the material in the scale hopper is discharged.

Garrison Brothers master distiller Donnis Todd says the modifications allowed the business to quadruple production, from a 500-gallon batch to 2,000 gallons/batch. "The control system for the grain handling operation provided by Coperion K-Tron has allowed us to maintain the complete mash room operation with just one operator. The service and expertise provided by both Robert Petrin and the Coperion K-Tron system engineering team has been invaluable for our growth, and has resulted in a true partnership."

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