

Press Release



# ARIZONA FLOUR SILO UPGRADE

Measuring flour and wheat is tricky because silos are typically cloudy atmospheres requiring sensors that measure using radar technology. BinMaster provides these sensors to agricultural operations world-wide. BinMaster sensors were incorporated into the Bay State Milling Company storing high-fiber wheat varieties.



# BAY STATE MILLING THRIVES WITH VARIETY

As Bay State Milling Company rolls out its new HealthSense® high-fiber flour products, derived from a group of high-fiber wheat varieties, the privately-held company needed a place to store those varieties to preserve their identity.

"This is not a commodity wheat that can be stored conventionally," says Project Engineer Drew Teigland, who has been with Bay State for nearly three years after nine years in the milling industry. "Bay State partners with farmers to grow these varieties, which we then own and store until needed." To meet this need, Bay State selected its flour mill at Tolleson, Ariz. about 25 miles west of Phoenix, to add 1 million bushels of slipform concrete wheat storage to the facility's existing 1.6 million.

"Tolleson is a world-class, commercial-scale specialty wheat mill positioned to service large, fast-growing markets," Teigland comments. The flour miller selected McCormick Construction Co., Greenfield, Minn., as general contractor and millwright on the grain elevator annex.

"We selected McCormick due to their industry knowhow and the trust we have built with them over previous years of projects together," Teigland says. "That selection proved to be even more important this year with COVID-19, as we needed to fully trust the work that was being performed, as the normal client/contractor onsite interaction was much more limited. They exceeded expectations."

Also taking extensive part in the project were VAA, LLC, Plymouth, Minn., which developed bid specifications, drew up preliminary contracts, and did structural engineering, and Knobelsdorff Enterprises, Goodhue, Minn., which served as electrical and automation contractor.

## IP Wheat Storage

The grain elevator addition at Tolleson consisted of 40 storage tanks – 24 round hopper tanks and 16 interstices – a section dedicated to a receiving bulkweigher and cleaner, and a three-hopper rail and truck receiving building. The large number of tanks provide a large number of separations. The slipform structure contains 5,700 yards of concrete and 785,000 pounds of steel rebar.

The big hopper tanks stand 21-1/2 feet in diameter and 129 feet tall. Each has a steel hopper bottom at a 45-degree slope.

Since turnaround will be fast, none of the slipform tanks are equipped with either aeration or grain temperature monitoring. However, both the tall tanks and the interstices are equipped with **BinMaster BinView inventory management software to monitor bin levels utilizing BinMaster Model NCR-80 non-contact radar level sensors.**

## Grain Movement

In the receiving shed adjacent to the elevator annex, Bay State receives wheat at 10,000 bph via both rail and truck, with the bulk of the volume coming by rail. Handling equipment for incoming wheat is set at 10,000 bph.

The pit hoppers empty onto a 10,000-bph AGI Tramco drag conveyor, which feeds another AGI Tramco incline drag. This, in turn, feeds a Schlagel 10,000-bph leg equipped with a single row of Maxi-Lift 16x8 TigerTuff buckets mounted on a 17-inch Continental belt.

The leg deposits grain into a C&A Scale 10,000-bph receiving bulkweigher for destination weights. From the bulkweigher, wheat is sent to one of four 3,800-bushel surge bins. The operator has the option of sending grain from the surge bins to an AGI Tramco loadout drag for loading to railcar or truck. The primary route from the surge bins, however, is to a Bühler TAS precleaner.

"The intent of the Bühler cleaner," says Teigland, "is to remove anything significantly larger, smaller, or light wheat. We will likely only be removing 0.5 to 1% of the impurities in the process, but we are conditioning the wheat so it is more stable and consistent in storage." From the cleaner, wheat is sent to an AGI Tramco cross-conveyor and up a Schlagel cleaning leg to rooftop drags to storage. Storage tanks empty onto AGI Tramco drags for transport into the mill. Near-infrared (NIR) data are used in a recipe system to blend wheat on the go using a set of 44 Bühler flow balancers.

Data is supplied by in-line ProFoss NIR testers located just before the bulkweigher and on reclaim from storage when blending into the mill. The units read moisture, protein, amylose, and total dietary fiber.

"Each railcar and truck is analyzed continually and data recorded every 15 seconds," Teigland explains, "which will give us a great composite sample as opposed to a grab sample. This sets us up better for when we ultimately blend wheat with our recipe system. The reclaim NIR automatically adjusts flow out of the tanks to target total dietary fiber, which will allow the most consistent product for our customers."

"We're very happy with the features and operation of the new elevator," Teigland says, "and we are excited to grow the HealthSense® high-fiber flour offering for our customers and communities."



Everybody eats. Keeping up with the global demand for human and animal food is a constant challenge. You need accurate data if your business is growing, storing, or processing the harvest. Get sensors that help you comply with government regulations such as USDA or FSMA. BinMaster offers complete systems to precisely manage inventory for one bin or a global operation. Find the right solution for level measurement and real-time reporting to optimize profitability whether you're buying or selling.

# Space for a Specialty Wheat

Bay State Milling Company adds storage at Tolleson, AZ flour mill for high-fiber variety.

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Bay State broke ground on the grain annex in January 2020, and the facility began receiving wheat in December.

## IP Wheat Storage

The grain elevator addition at ►



Aerial view of the Bay State Milling Company flour mill in Tolleson, AZ, with new 1-million-bushel elevator annex at far left. Photos courtesy of McCormick Construction Co.



*Aerial view of the annex rooftop with 10,000-bph AGI Tramco drag conveyors depositing wheat into 40 upright and interstice bins.*

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*Construction nearly completed on the rail and truck receiving shed with triple-hopper pit.*



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*Hopper tanks empty onto a reclaim conveyor. An automated recipe utilizing data from ProFoss in-line testers allows for custom blending of wheat on the go.*

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*Ed Zdrojewski, senior editor*

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Industry	Bulk Material	Sensors	Software	Applications
 Agriculture Farming Livestock	Grain Flour Beans Fertilizer Seed Liquids  Bins, silos, tanks, piles, domes	Rotary level indicator Capacitance probe Vibrating rods Diaphragm switch Tilt switch Radar SmartBob 3D sensors Ultrasonic Flow detector	BinCloud BinView AgriView Binventory FeedView 3D Multivision	Prevent overflows Process control Inventory management Remote monitoring Monitor piles Flow detection Bin aeration Dust detection Aeration Ag Chemical Storage
 Bioenergy	Corn DDG Biomass Wood pellets Wood fiber Forest residue  Bins, silos, tanks, piles, domes	Rotary level indicator Capacitance probe Vibrating rods Diaphragm switch Tilt switch Radar SmartBob 3D level scanner Ultrasonic Flow detector	BinCloud BinView Binventory 3D Multivision ResinView	Prevent overflows and outages Process control Inventory management Remote monitoring Flow detection Slurry tank detection Measure DDGS
 Cement	Sand Gravel Clinker Rock Powder  Bins, clinker silos, tanks, piles, domes, chutes, crushers	Rotary level indicator Capacitance probe Vibrating rods Diaphragm switch Tilt switch Radar SmartBob 3D level scanner Ultrasonic sensor Flow detector Plugged chute detector Airbrator Diffuser air pad	BinCloud BinView Binventory 3D Multivision CementView	Prevent overflows and outages Process control Inventory management Remote monitoring Monitor piles and bunkers Inventory domes Plugged chutes Measure crusher levels ESPs or clinker silos Prevent conveyor overloads Silo aeration
 Food processing	Brewing Foodstuffs Solids Slurries So much more...  Silos, mixers, batching tanks, conveyors, pipelines	Rotary level indicator Capacitance probe Vibrating rods Diaphragm switch Tilt switch Radar SmartBob 3D level scanner Ultrasonic sensor Flow detector Airbrator Diffuser air pad	BinCloud BinView AgriView Binventory 3D Multivision	Prevent overflows Inventory management Remote monitoring and VMI Process control Sanitary level measurement Detect levels in mix or slurry tank Detect levels on conveyors Flow detection Silo aeration
 Mining	Lump coal Ores Aggregates Fine alumina powder  Silos, crushers, conveyors, domes	Rotary level indicator Capacitance probe Vibrating rods Diaphragm switch Tilt switch Radar SmartBob 3D level scanner Ultrasonic sensor Flow detector Airbrator Diffuser air pad	BinCloud BinView Binventory 3D Multivision CementView	Inventory management Monitor piles Prevent overfills or outages Detecting plugged chutes Measuring inventory in domes Level measure in crushers or bins Prevent overloading Process tanks Remote monitoring Silo aeration Dust detection
 Plastics	Resins Flakes Powders Granules Re grind  Silos, bins, containers, hoppers, tanks	Rotary level indicator Capacitance probe Vibrating rods Diaphragm switch Tilt switch Radar SmartBob 3D level scanner Ultrasonic sensor Flow detector Airbrator Diffuser air pad	BinCloud BinView ResinView Binventory 3D Multivision	Prevent silo overflow Eliminate outages Inventory management Remote monitoring Vendor managed inventory Flow detection Bin Aeration Dust Detection