



Thompson Scale Company

WEIGHING SYSTEMS & PACKAGING MACHINERY CONTROLS

Case Study:

Rinker Materials Corporation

Rinker Increases Production with Weighing Equipment and Software

Introduction

Rinker Materials Corporation is one of the largest producers of bagged cement, ready mix concrete, and concrete block in the United States. They provide a diversified offering of construction and building materials, including cement, aggregate, brick, glass block, reinforcing steel, construction chemicals, drywall, and fireplaces.

Rinker Materials provides high quality cements including Portland Types I and II, White Portland, Stucco Cement, Roof Tile Cement, and a full range of white and gray masonry cements. From ready mix concrete and pre-cast producers to building material supply houses, Rinker Materials cement remains a trusted brand. Rinker's cement terminal in Port Everglades, Florida is a major packer and supplier of bagged cement and bulk products. When they were looking to increase the productivity of their terminal, they quickly turned to Thompson Scale Company (TSC) for the solution.

The Challenge

Rinker wanted to increase the level of cement production by improving the efficiency of their Port Everglades terminal. They were looking to set up a system that would help their packaging process run smoother and produce bags that were even closer to their target weight goals, while providing the safest environment possible for their employees. The requirements became evident; an in-motion checkweigher (phase one), data collection software (phase two), and a packer upgrade (phase three).

The small amount of space they had available in their existing conveyor line made installation of a checkweigher a real challenge. Normally, heavy-duty checkweighers require about four feet of linear space to properly weigh a bag. Rinker required a checkweigher to be installed in only three feet of space. They also needed a product rejector powerful enough to remove off-spec bags from the production line, yet able to be located within the same space. The bag flattening incline conveyor immediately after the checkweigher would also make it more difficult to obtain accurate weights of the bags. This presented a challenge because the immediate slope at the infeed of the incline causes the bags to create a downward force on the checkweigher as they go up the conveyor, potentially altering the bag weights.

Juan Alvarez, Terminal Manager at Rinker Materials stated, "We only had a small amount of space available between the turning conveyor and the bag flattening conveyor. This made the addition of a checkweigher more difficult."

To assist them in targeting their optimum bag weights, Rinker knew they would need data collection to analyze weights and generate reports. These reports would be a valuable source of data, assisting management in making informed decisions. The challenge with setting up this phase of the project is that their management office is located in a different building than the packing warehouse. To complicate matters, the road in between the two buildings is a heavy traffic area for semi-trucks. Any cables would have to be hung high overhead or dug into the ground, which would be expensive.

The St. Regis 150 four-spout impeller packer used by Rinker has each spout on close centerlines, which presents several engineering challenges. The load cell flexure assemblies would have to fit into an extremely restricted access area with spouts on very close centerlines. A fill spout and product cut-off assembly needed to be designed that placed the fill spouts in exactly the same position as the old mechanical system, this would allow automatic bag placers and take-away conveyors to be used without modification. A product cut-off assembly would also have to be designed to eliminate product spillage, yet keep the fill nozzle and spout from plugging between fills.

Thompson Scale, in conjunction with Choice Bagging Equipment (CBE), had already developed and successfully installed electronic upgrades in Rinker's sister plant in Miami, as well as several other companies within the same industry. This made TSC and CBE the right vendors for this upgrade.

TSC Solutions

Thompson Scale and its wholly owned subsidiary, Telemetry Solutions, have provided a complete solution for the improved efficiency Rinker wished to achieve in the cement packaging line at their terminal. TSC installed a 4693 Heavy-Duty Checkweigher and StatPak-PC real-time data collection and reporting software, along with upgrading Rinker's St. Regis 150 cement packaging machine.

Heavy-Duty Checkweigher

Rinker's production line of various cement and masonry products needed a checkweighing system set up to increase the efficiency of production and consistency in the weight of their cement bags. They immediately knew that Thompson Scale had the equipment they required for the job.

Juan Alvarez stated, "We have another terminal in Miami that has a couple of checkweighers installed and they are very pleased with their performance." When asked what first inspired Rinker to look for a checkweigher for their terminal, Mr. Alvarez replied, "We were looking to increase our production rate, while another main reason was safety. We were using manual labor to get the weights of the bags. This required us to stop the process and have someone pull a bag and put it on a scale to check the weight. We were checking bag weights every thirty minutes which was harder for our workers and took away from production time."

Thompson Scale met the lack of space challenge by designing a unique compact checkweigher with a space-saver reject ram. The smaller sized 4693 Heavy-Duty Checkweigher still provides the same accuracy, features, and functionality as a full-sized unit, along with extremely fast weighment cycles to meet the application requirements. The innovative reject device is built onto a support isolated from the scale, yet places the reject pusher plate directly at the discharge end of the scale. The plate is suspended from an oversized rodless cylinder capable of ejecting an off-spec bag and returning to the 'home' position before the next bag enters the scale – even at high production rates.

The 4693 Heavy-Duty Checkweigher has an important feature that helped make this installation possible. A photo-eye is attached to the checkweigher to quickly terminate the weight, which allows for more accurate weighing in such a tight space. This also assists in the bag reject system by obtaining the weights quicker than normally possible.

Another feature of Thompson Scale checkweighers are their easy to use controllers. "The checkweigher controller is very simple for our operators to use. There are even additional functions available that we could also use if needed," Mr. Alvarez stated. These functions include options such as settable filters, storing 75 different product types, displaying errors for mechanical and system faults, as well as bilingual menus.

StatPak-PC Real-time Reporting

An important part of Rinker's production process is the real-time data collection and reporting software system that they wanted installed. Telemetry Solutions' StatPak-PC system sets itself apart from all other reporting software with its concise design and powerful reporting tools, yet is much more cost effective than competitive systems. This system allows users to easily view production data on a PC, so they can quickly and easily adjust production to optimal levels and analyze production flow over a period of time.

When asked why they decided to collect weight data, Juan Alvarez replied, "We installed it to double-check the paperwork that the bagging employees submit by comparing it to the production rates we show in the system to monitor performance in the terminal."

The software proved to be easy to install, configure and use. The challenge of sending the data to PCs in a separate office without incurring additional expenses of running cable was handled by Thompson Scale's engineers. A wireless modem was set up to transmit the data to the management office. This worked very well even with the heavy truck and plant radios used throughout the day. The production line data was flawlessly received in their office, without the need to run any wires.

StatPak-PC is used to monitor 100% of production in order to track production rates. “We bag throughout the week, and every day that we do bagging, we monitor production rates at the closeout by running a report from StatPak-PC,” Mr. Alvarez stated.

From line operators to experienced production supervision and corporate management, they all have access to the information they need to help them make more informed decisions that have an effect on the profitability of the company.

Packer Upgrade

Thompson Scale provides filling machinery upgrades to update them from counter weights and manual controls, to a system with automatic controls and a load cell for more efficient use of older technology. The company worked with Choice Bagging Equipment, who was involved with the design of a number of mechanical parts, mechanical fabrication, installation, and start-up of the filler upgrade. Another firm assisted with upgrading the existing bag placing equipment. Thompson Scale provided the controls and technology to complete the upgrade process.

As far as the actual installation went, Mr. Alvarez had this to say, “The installation went smooth and there weren’t any major issues. Three different companies worked together to upgrade our equipment and everything worked out great.”

When asked what prompted Rinker to upgrade their packaging machinery, Juan Alvarez said, “The machines were getting old and required a lot of maintenance. We used mechanical scale beams that were only accurate up to plus or minus one pound. We wanted to get the accuracy to plus or minus half a pound. The other part was to increase the overall speed.”

Rinker made the choice to upgrade their packing machinery versus buying new machines. Mr. Alvarez stated, “The terminal in Miami upgraded their packing equipment first which worked well and the equipment is almost maintenance free – that made our decision real easy.” Thompson Scale designed a system for Rinker that was extremely easy to maintain, with few wear parts and quick changeover of replacement parts.

The Results

Heavy-Duty Checkweigher

Rinker has experienced many benefits since installing the 4693 Heavy-Duty Checkweigher in their cement production system. “The main improvement is our increased bag per man hour rate which has gone up over the last couple months. Now, we can constantly monitor weights without having to stop the operation,” Juan Alvarez said.

“The other important aspect is safety, the risk of injury is less. Our employees enjoy the improved safety and have more comfortable working conditions by not having to handle the bags to weigh them. Also, if we have any reject bags, the checkweigher rejector pushes them off the conveyor without someone having to handle the bag. Our production is faster and safer and we have really noticed the increase in our cement production rate,” he added.

StatPak-PC Real-time Reporting

StatPak-PC allowed them to quickly and easily adjust their production lines to even better levels. Since installing the reporting software, Rinker has noticed the benefits through more efficient production. “We track and monitor production through the data we get from the StatPak-PC system. I can see a production increase happening on a monthly basis. We can also track inventory better through the computer and analyze data such as number of bags per minute, total weight, and any variance. The reports we generate are really helping us in monitoring the terminal.”

“The software helps us maintain a constant quality and weight on the bags. This accuracy also makes the appearance of the bags on the pallets look even better,” Mr. Alvarez added.

When StatPak-PC software is used, the results are an increase in efficiency and quality. This optimized production leads to decreased expenditure and substantial cost savings over time. Juan Alvarez summed it up with, “We like the StatPak-PC reports that can be run, we get a lot of valuable information that used to be created manually.”

Packer Upgrade

When asked about the improvements seen due to the packer upgrade, Mr. Alvaraz said, “The number one thing is a significant increase in production. Before, our filling time was 12 to 15 seconds per bag. We operate at 8 or 9 seconds now, which has really increased our overall production. Another bonus is that only one person has to run the bagging equipment since it’s automated. Now, the system can be run with one operator that can see the automatic bag placer at the same time as the controller and easily check the weights of each bag. This has saved us a lot of man-hours. Along with that is improved safety, our employees do not even have to be near the conveyor belts anymore.”

In addition, Mr. Alvarez mentioned, “The operation is running smoother now with almost no maintenance required. The calibration is simpler too, before we would have to have an outside contractor come in to do the calibration for us. It’s easy enough for us to do it ourselves now. The changeover is also greatly improved and the equipment is more reliable now.”

Another improvement made to the packer was in product spillage at the spouts. The original St. Regis 150 design allowed product to spill freely from behind each spout, even when the spout was filling a bag. The upgrade eliminated almost 90% of this spillage, reducing dust in the area and greatly reducing reclaim.

Summary

When asked how long it might take to reach an ROI and justify the expenditures, Mr. Alvarez had this to say, “We did a quick study that showed an increase in production while there was a sharp decrease in labor and maintenance. It’s significant enough that we should see a return on investment within a relatively short time.”

The consistent drive to make continuous improvements such as these is one of the reasons Rinker Materials remains a leading manufacturer and distributor of high quality cements. Thompson Scale, along with its subsidiary Telemetry Solutions, met the challenges that Rinker faced with adding new equipment to their packaging line by using new innovations and product designs. We are dedicated to providing customer solutions that work, while overcoming any challenges that may arise during the installation of our products. TSC makes it easier for companies to improve their production and achieve even greater success.

To sum up the installation and Thompson Scale’s products, Juan Alvarez stated, “It was a very good experience. I will definitely recommend Thompson Scale.”

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