

Case Study

Batching and Blending

Solution for tire manufacturer reduces equipment costs and increases accuracy and performance

Challenge

- Reduce equipment costs
- Achieve reliable and accurate weight given mechanical noise of mixers
- Automatically pass process information on to audit trail

Solution

Each ingredient has a scale with:

- Hardy ADVANTAGE® compression load points with C2® Electronic Calibration
- Hardy Junction Box
- HI 4050 Weight Controller with WAVERSAVER® and Ethernet IP communications

Results

- Reduced equipment costs by 30%
- Gained accuracies of 1 part in 10,000
- Passed on zeroes, calibration records, and dead weight checks to PLC to meet audit trail standards



A large international tire manufacturer based in the United States has a time-proven recipe for making vulcanized rubber for their high end automobile tires. One of their plants in the US was looking to update the design of their vulcanized rubber mixers. The process involves rapid batching up to 12 ingredients (rubber, oil, carbon black, etc.) with high accuracy in Banbury mixers with the presence of mechanical noise from the mixer motors. This plant also has high standards for audit trails, every part of these sensitive processes needs to be automatically recorded and sent to a data system for quality management.

THE CHALLENGE:

This plant was under pressure to reduce the fixed capital costs of their rubber batching equipment while still maintaining high performance. The vibration created by 2500 HP mixing motors on the Banbury mixers made stability and accuracy difficult for normal weighing systems, creating a significant obstacle given that the quality team demands 1 part in 10,000 accuracy in this batching process. Important process data the engineers needed for audit trails (zeroes, dead weight checks, calibration records) was not available from other scale vendors they were considering.

THE SOLUTION:

In order to eliminate mechanical noise caused by the mixer motors from the weight measurements the engineers used Hardy's WAVERSAVER® feature to remove the vibration from the process measurement and obtain stable and accurate weight with the mixers running. Hardy's ADVANTAGE® load cells were durable enough for the application (IP68, hermetically sealed) and along with Hardy's HI 4050 Weight Controller the solution could deliver the accuracy needed to satisfy their high quality standards. By selecting the HI 4050WC instrument, the engineering team was able to configure a cost-saving unit with "just enough" capabilities for this application. They chose a blind DIN rail instrument with Ethernet IP communications to route critical information back to an Allen-Bradley® PLC.

THE RESULTS:

With the installation of the Hardy ADVANTAGE load cells and the HI 4050WC with WAVERSAVER, this tire plant saved money on the cost of their equipment and increased performance. Their throughput increased substantially, with the Banbury continuously mixing batches while weighing and increasing the batch cycle to every 2-3 minutes from 5 minutes, providing a total plant performance of 4 million pounds of rubber a day. Instrument costs were lowered by approximately 30% and they didn't have to give up their important data information or quality needs. In the words of one of their process engineers when asked about their Hardy equipment, "It works. It's simple to setup, it's reliable and accurate...trust me; I push our vendors hard when there are problems and the Hardy doesn't give me problems."

EQUIPMENT USED:

Hardy ADVANTAGE load cells with C2® electronic calibration, HI 215JB Junction Box, and the DIN rail mountable HI 4050 Weight Controller without a display and configured with Ethernet IP communications.

EXAMPLE CUSTOMERS and APPLICABLE INDUSTRIES:

Tire manufacturers, and any manufacturer that processes raw ingredients (natural rubber, polymers, oil, pigments, etc.) into vulcanized rubber for the tire industry or other vulcanized rubber applications (e.g. rubber seals and gaskets, transmission belts, shoe soles).

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