PROBLEM SOLVED™ PAPER

SOLUTION: Martin® Typhoon Air Cannons

INDUSTRY: Beverage production

LOCATION: Citrosuco; Matão, Brazil

Citrosuco is one of the world's largest orange juice producers, and uses sugarcane bagasse as a fuel.

Silica clogged ductwork by 90%, causing pressure to build within the system and posing a potential risk.

Air cannons were set to fire in quick succession to promote the consistent flow of particles and gas.

PROBLEM

Citrosuco is one of the the world's largest orange juice producers, and in 2009 the company switched from Brazilian petroleum fuel (BPF) oil to using a sugarcane bagasse hot gas generator. But excessive silica particle buildup in ductwork caused production to slow down and posed a potential hazard to workers. The silica buildup issue required 10 days for cleanup, forcing them to burn the far more expensive oil during the remediation process. To clear the obstruction, the bagasse incinerator had to lay dormant for 4 days as the molten silica cooled and hardened. Workers would then enter the duct wearing specialized protective gear to chip away the hard mass with pneumatic hammers, which required roughly 4 days to complete.

SOLUTION

Company representatives visited several cement production facilities with similar needs for their calcination process and found that nearly all of the facilities successfully utilized Martin® Air Cannons. A plan was formulated that included a combination of twelve 70-liter (88 lb/40kg) and 150-liter (124 lb/56 kg) air cannons. "We positioned them in a staggered pattern along the horizontal duct," explained Brad Pronschinske, Global Product Manager of Flow Aid Products for Martin Engineering. "The cannons were set to fire one after another in quick succession, starting at the elbow, to promote consistent flow of particles and gas through the system."

RESULT

"Since it was a pioneering application, we had a bit of an apprenticeship with the air cannons at the beginning," recalled a Senior Project Engineer for Citrosuco. "Today, the air cannons operate with the maximum number of shots allowed. After the last cannon fires, there is only 1 minute of lag time until all reservoir vessels reach the 7.0 BAR (101 PSI) of pressure needed to discharge again." The schedule is maintained 24 hours per day throughout Citrosuco's entire production window. Halfway through their third season of use, operators have reported no unscheduled downtime, no need to use fuel oil and only minimal post-season silica buildup.

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