

Ozone Installation for Resort Area Central Laundry Speeds Up Production 10%, Increases Productivity Over 20%

Also Increases Washer Capacity and Enhances Goods Quality; Cuts Chemical, Utility, and Goods Replacement Costs



A small cabinet, 3-1/2 ft. wide x 6 ft. tall x 1 ft. deep, contains two ozone generators. The injection process features 24-hr. remote monitoring, data logging, and troubleshooting. The ozone system has sped up production by 10%, while increasing pounds per man hour by over 20%.

**Table #1:
Key Results**

- Washer now running at 2500 lbs./hr, up from 2100 lbs./hr
- Transfer time from pocket to pocket down from 2 min. 30 sec. to 2 min. 15 sec.
- Total processing time now 18 min. vs. 20 min.
- Productivity of 75-85 lbs/man hour increased to 90-105 lbs/man hour.
- 50% drop in lint production
- 40-50% cut in costs for alkali, detergent, and bleach
- Significant natural gas savings



Total CBW processing time is now 18 min. vs. 20 min., and terry dryer times are down 2 min. on average. Previous productivity of 75-85 lbs/man hour has been increased to 90-105 lbs/man hour. Equipment is running less, and with lbs/man hour up, staff is off the floor and off the clock sooner.

Virginia Beach, VA — The director of laundry operations for a 4 million lbs/yr time share/hotel central laundry here reports that installation of an ozone system has sped up his production line by 10%, while increasing pounds per man hour by over 20%. He also notes a 20% increase in washer capacity; whiter, softer, and brighter goods coming out of the dryer; and significant cost reductions for chemicals, natural gas, and goods replacement.

His operation receives about 94% of its load as light-soiled linen and terry from 5 hotels and 4 timeshares, and the balance as napkins and tablecloths from 3 restaurants.

“Our Milnor 8-pocket continuous batch washer (CBW®) is now running at 2500 lbs./hr, up from 2100 lbs./hr, and transfer time from pocket to pocket has been reduced from 2 min. 30 sec. to 2 min. 15 sec.,” said Jim McAllister of Gold Key/PHR Laundry Service. “Total processing time is now 18 min. vs. 20 min., and previous productivity of 75-85 lbs/man hour has been increased to 90-105 lbs/man hour. When we’re running 70 transfers like we did today, that’s running equipment 140 min. less, and with lbs/man hour up, staff is off the floor and off the clock sooner.”

“Meanwhile, the properties we serve are seeing goods that come out of the dryer whiter, brighter, softer,” he continued, “while our 55-gal. lint drum is now being emptied every 3-4 days instead of every other day, a 50% drop in lint production that means their towels and sheets are lasting longer.”

“We started up this facility in 2005, and started thinking about ozone three years later, after we had installed a fourth Milnor dryer to speed things up. The ozone was supposed to make you even faster, as well as cut chemical and utility costs, and we have certainly realized all those benefits since we installed the ozone system in the spring of 2009.”

McAllister noted significant natural gas savings because the wash water does not need to be heated any more, and estimated a 40-50% drop in costs for alkali, detergent, and bleach. He remembered previous uneasiness about ozone.

“I had seen ozone displays at a trade show 10 years ago, and I had a snake oil feeling about it,” he recalled. “But the laundry consultant we hired to help us build the facility said that Guardian Manufacturing knew what they were doing, and that they had done some development work especially for applications like ours. I was impressed with the reliability levels they had been able to achieve with other industrial applications like processing water for isolated oil rigs and public wastewater treatment plants, and we had a lot of confidence in our facility consultant, so we moved forward with it.”

The central laundry operation peaks during June, July, and August at 7 days/wk, 1 shift/day, 100+ loads/day. The plant runs 5 days/wk, 1/2- 3/4 shift each day during the rest of the year. Drivers pick up soiled goods from nine locations starting at 5:30 am, and the 27-person laundry crew begins arriving at 6:30 a.m., working until finished between 3-5 p.m.

Water usage for the CBW is 0.55 gal./lb. of soiled goods for normal room linen processing, as compared to 3 gal./lb. for typical washer/extractors. Two washmen feed the CBW at 130-150 lbs. per pocket, using codes for the submitting resort property and the type of goods, with no further human intervention until the goods are out of the four 300-lb. Milnor dryers. The dried and conditioned goods are dumped into carts for routing to the folding or ironing finishing stations, and then are loaded onto property-specific, color-coded delivery carts for shipment back to the customer hotels, timeshares, or restaurants.

A small cabinet, 3-1/2 ft. wide x 6 ft. tall x 1 ft. deep, contains two ozone generators. The injection process features 24-hr. remote monitoring, data logging, and troubleshooting.

“When the ozone gets into the fibers, especially the terry, it makes them pop open, which is what makes the goods come out of the dryer whiter, brighter, and softer,” McAllister said. “Due to the injection of ozone into the wash water, we are experiencing impressive cost reductions in terms of lower chemical usage, as well as lower natural gas usage, from using cold water now. We are also seeing reduced time in the dryers.”

Guardian Manufacturing regards its success in ozone applications like Gold Key/PHR as deriving from long-term research and development for its products, and an integrated, customized approach to manufacturing and installing them. That process begins with establishing a preliminary savings estimate based on annualized laundry costs, with the main factors including gas, electricity, water, sewer, and chemicals.

Tom Allen, senior laundry application specialist, noted additional factors in the company’s program.

“In our efforts to develop an ozone process for tunnels, it’s been very helpful for us to gain hands-on experience with tunnel washers from various manufacturers,” he said. “However, the Milnor CBW has proven to be the best installation for us to date.”

“Our patent-pending process application takes full advantage of the consistent water flow pattern within the Milnor. The pumped re-use and counter flows allow us to maintain constant, as well as varied, levels of ozone in the wash and rinse zones of the CBW. Tunnel process parameters such as transfer rate and water flow rate vary for each installation, and accordingly usually require software and hardware modifications for each one.”

“Previous ozone systems for tunnel washers were mostly adaptations of OPL ozone systems, and did not have the versatility or controls ability to adequately produce and validate quality results,” Allen continued. “Tunnel plant operators live and die by production efficiencies. They cannot afford to take a gamble on an ozone installation, with no real backside performance validations and process monitoring. Therefore, Guardian has engineered a holistic process that not only makes ozone, but one that ensures the washers, ozone generators, and chemistry are all performing together as they should.”

Allen explains Guardian’s successes across multiple laundry platforms, from simple hospitality OPL’s to central tunnel system plants, as deriving primarily from its advanced controls technology.

“The need has always been there for an ozone laundry process that contained not only quality ozone generators and oxygen systems, but the combined monitoring and control systems, with self-diagnostic software packages, to run them,” he noted. “We had seen the challenges that were created for laundry operators who had simple, on/off ozone laundry systems.”

“When an operator asked how they would know if a system was working properly or not, the most common answers were that you won’t smell the ozone, or that the laundry wouldn’t be clean. This was not an adequate solution for a plant processing thousands of pounds per hour, with no human contact until the finishing stations, so it was not good enough for Guardian’s product line.”

“We have gone to great lengths to engineer a complete system that can be as self-sufficient as any particular application may dictate,” he stated. “We’ve also learned not only to carefully consider the chemistry of the wash water, but the derivation of the soiled goods, and consequent organic and inorganic introductions to the wash process.”

“As a result of our long-term, diversified experience, we’re now able to routinely provide a preliminary savings analysis, and also offer a 90-day money-back guarantee for any laundry operation. We are confident that

our customers will not experience hidden production problems that would negate overall savings, such as having to process periodically increased stain loads caused by ozone system issues.”

Thoram Charanda, senior scientist for Guardian and manager of its research and development laboratory, noted the importance of a reliable, energy-efficient ozone generator.

“We saw from the laundry industry’s unhappy prior experience with ozone that without a reliable generator that provides consistent production, great challenges would occur,” he said. “If the ozone is not there, you’re not going to have good linens.”

“We also strive to maximize the amount of oxygen converted to ozone, using the least amount of energy,” he continued. “Ozone is converted at the rate of 5 to 10% by weight, aided significantly by an oxygen concentrator that provides a source of oxygen that is consistent at 94%. And the very high frequency is also well above the audible range, so there is no high-pitched whine, which we had learned was an additional complaint about ozone.”

For laundry applications, in addition to generator reliability and efficiency, Charanda also noted the critical need for efficient delivery of the ozone into laundry wash water, and the importance of knowing ahead of time the chemistry of that water, including chemicals added to it during the wash process.

“We are injecting ozonated water directly into the wash wheel using a premium Venturi-type system that consistently provides mass transfer efficiency at the level of 90% or more,” he said. “Meanwhile, we never assume the water is okay in the first place.”

“The key issues are the presence of inorganics like iron and manganese that could react with the ozone and cause problems. In addition, detergents can introduce very complex issues, as can surfactants, brighteners, bleach, and other additives. Our applications experience with the water chemistry, as well as the different types of washing machines, has helped us greatly in our ability to deliver our high level of performance.”

Guardian has integrated almost 1000 ozone generators into systems manufactured by the company since 2003. For further information on its Ensure-LCR™ ozone systems for laundry applications, featuring PlasmaBlock® advanced oxidation generators, and opportunities for preliminary site analysis, contact Guardian Integrated Services, 2971-A Oxbow Circle, Cocoa, FL 32926, Tel. 321-631-4580, Fax 321-631-4517, laundry@guardianmfg.com, www.guardianisd.com.



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