

MGK



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Company Background

McLaughlin, Gormley, and King (MGK) is a chemical manufacturer specializing in insect control solutions. Originally founded in 1902 with a focus on botanicals and food spices, MGK evolved its talents, knowledge and business into a respected manufacturer of insect control solutions. Their first insecticide product was launched in 1927 and was based on pyrethrum, a natural insecticide found in a species of the chrysanthemum plant. Since then, MGK has registered more than 300 formulations. Each product seeks to provide a responsible and sustainable solution to help protect people and their environments from the impacts of insects.



“The MnTAP internship program was an invaluable opportunity to gain experience and build confidence in working in industry. It was challenging, engaging, and rewarding to be able to lead a project that would bring real benefit to my company.”

Project Background

This lean manufacturing project is focused on optimizing the use of solvent for production tank rinsing. Between production runs, tanks are cleaned with a triple rinse of solvent to avoid contamination and comply with industrial regulations.

The current tank cleaning procedure has been in place for over two decades and has been successful; however, increasing customer demand and industry requirements suggest it would be prudent to validate its efficacy. By monitoring the rinse cycles, taking samples of solvent after each rinse, and analyzing the data, MGK can better quantify and understand its rinsing protocols and provide opportunities to reduce solvent use and update their standard operation procedures. Other elements of the project involved taking inventory of all facility motors, evaluating motor system energy conservation opportunities and suggesting improvements in the compressed gas systems.



Incentives To Change

MGK is poised for additional growth, having recently acquired an industry competitor. To comfortably meet the demands of the future, MGK will need to expand its production process expertise. Throughout the years, MGK leadership has fostered a spirit of continuous improvement. Leaders empower their teams to deploy lean methodologies to solve problems and exploit opportunities, with a focus on improvement to process areas. By focusing on eliminating wastes within processes, MGK can continue to thrive in the insecticide market and stay resilient to competition. With the reduction of solvent use, MGK can show strong environmental stewardship and support its corporate sustainability goal of reducing natural resource use.

Solutions

Modify Tank Rinse Procedures

Option 1 - Double Rinse Tanks When Applicable

I worked with the MGK quality team to set a tank cleanliness target in the formulating area with quantitative and qualitative elements. Data collected over the summer indicated that the triple rinse system is often more than sufficient in meeting the current tank cleanliness target. If products are broken down into categories based on active ingredient level, then different cleaning procedures can be in place for different types of products. Data analysis showed that products with an active ingredient level of less than 20% were consistently clean after two rinses. Implementing a double rinse cleaning procedure for these products would reduce the yearly amount of solvent used for tank cleaning by at least 5% and bring at least \$4,000 in annual savings.

Option 2 - Shorten Cycle Time Of Third Rinse

While a cleaning process consisting of two rinses is not adequate in certain cases, there is opportunity for reducing the amount of solvent used in the third rinse. The mechanics of the current rinse pumping and piping system are such that the third rinse is generally the heaviest in a tank cleaning process. By the second rinse, the majority of the residue has already been removed from the sides of the tank. Therefore, it is a form of extra processing waste to allow the most solvent to be used in the final rinse. If the rinse system is modified so that the cycle time of the last rinse is halved, solvent waste generated from tank cleaning would be decreased by at least 10% for approximately \$10,000 in annual savings.

Option 3 - Reinstate The Recycle Solvent Program

The solvent drained after the third rinse could be reused as the first rinse in a subsequent tank cleaning. This procedure was in place at one time at MGK, but has since lost momentum due to efficiency setbacks. Continued investigation and improved recycle rinsing procedures would bring significant savings, and is an excellent way to make use of what would otherwise be disposed of as hazardous waste. This has the potential to cut solvent usage for tank cleaning by 1/3 and saving an estimated \$21,000 annually.



Repair Leaks And Maintain Compressed Gas Systems

MGK uses compressed air and nitrogen in several processes and to power certain equipment. Leaks in systems such as these often go unnoticed since many are not audible or are overpowered by equipment noise. Compressed air and nitrogen leaks around the facility make the systems less efficient and waste electricity. Additional energy is required to compensate for what is lost through the leak. By fixing the leaks and improving the system maintenance program, there is a potential savings of \$10,000 per year.

Install Variable Frequency Drives (VFDs):

Certain motors in the facility would benefit from the implementation of a VFD, which adjusts the speed of a motor relative to the amount of power a system calls for. In the facility, several motors run at full capacity and have long run times, though the system has variable requirements. Installing a variable frequency drive on various motors in the MGK facility would bolster the electrical efficiency of the facility. An initial evaluation of VFD implementations shows an annual savings of \$16,000.

Recommendation	Reduction	Annual Savings	Status
Modify tank rinse procedures	27,600 lbs solvent	\$21,000	In progress
Repair leaks/maintain compressed gas systems	122,400 kWh	\$10,000	In progress
Install VFDs	177,400 kWh	\$16,000	Under review