

New Jersey Program for Manufacturing Excellence



NJME is a technical assistance program for NJ industries that is operated through the Center for Advanced Energy Systems (CAES) at Rutgers, The State University of New Jersey.

Funded by the New Jersey Department of Environmental Protection's Office of Pollution Prevention and Right to Know, the purpose of the program is to improve the competitiveness and efficiency of New Jersey companies, while also reducing the impact on the environment. NJME accomplishes this by promoting energy efficiency and pollution prevention.

For more information:

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NJME Assists Major Metal Drum Manufacturer

Reduce Heating Losses and Optimize Compressed Air

Usage

Summary:

Since its inception, the New Jersey branch of the Mauser Corporation has pioneered the transport of goods around the globe for industrial purposes with environmentally friendly packaging solutions. Dubbed the "Aniline Drum" by the company, the heavy steel drum was an invention that laid the groundwork for the young business and modern industrial packaging. Located in Woodbridge, New Jersey, Mauser's metal packaging plant is central to the Philadelphia, Newark, and New York business districts, as well as the national and global networks through major roadways, shipping ports, and airports. The **New Jersey Program for Manufacturing Excellence**, operated at the Center for Advanced Energy Systems at Rutgers University, worked with Mauser to identify solutions for more efficient energy usage, substantial cost savings, and a significantly reduced carbon footprint. The recommendations cited by NJME that Mauser has implemented has an estimated savings of over 11% and 9% of natural gas and electricity resources respectively, with an additional 10% combined utility cost savings with short to moderate payback.

Company Background:

In 1867, Mauser Corporation was founded by Dr. Alfons Mauser on the premise of iron fence manufacturing through a process that would eventually be known as metal recycling. Today, Mauser has a stake in several commercial and industrial markets, including plastic packaging, metal and fiber products, and intermediate bulk packaging containers (IBCs). The steel drum manufacturing facility at Woodbridge contributes to Mauser's presence of being the #2 steel drum manufacturer in the world with several million drums sold annually. An energy consumption analysis performed by NJME shows that the plant used 7 Million kWh of electricity and 64,000 MMBtu of natural gas for a total of \$1.3 Million in energy expenses in 2002. In addition, Mauser generated 6,459 tons of CO₂ in the same year.

Assessment Approach:

The NJME team of engineers conducted an assessment of Mauser in July 2007. Recommendations identified by the NJME team were assembled into a report and presented to plant managers in August 2007.

Energy Conservation and Awareness:

- Mauser uses a reverse thermal oxidizer (RTO) to destroy any volatile organic compounds (VOC's) coming off of the ovens and paint areas in the plant. During the assessment, NJME determined that the temperature of the heat being rejected off of the machine was as high

as 250°F. NJME recommended insulating the RTO surface with fiberglass sheeting, which would minimize furnace heat losses and lead to gas resource and cost savings.

- NJME recommended that Mauser institute a preventative air leak maintenance program, as both compressors being used at the time were two large 200 HP rotary screw compressors which would make leaks more pronounced and expensive. Eliminating leaks within the air distribution system would yield electrical and monetary savings.
- NJME also identified insulation needs on the curing ovens. Though a 3-inch thick blanket of fiberboard would come at a higher than average capital cost, it would be an effective method of cutting the power draw and preventing sections of the plant near the ovens from becoming too hot.
- On the plant tour, NJME learned that the compressors available were installed in the 1970s. The three compressors were connected in a closed-loop, with one being a backup. With one compressor at full load and another 75% loaded, NJME recommended implementing new variable frequency drive (VFD) compressors in place of the old inefficient units. VFDs would allow the compressors' power to adjust to the required load of the plant, therefore lowering power consumption.

Projects Identified:

AR #	Assessment Recommendation	Annual Resource Savings	Annual CO ₂ Reduction	Annual Cost Savings	Net Imp. Cost	Simple Payback Period
1	Insulate RTO Furnace	5,561 MMBtu	325 Tons	\$48,775	\$3,384	0.08 yrs
2	Reduce Compressed Air Leaks	138,079 kWh	53 Tons	\$14,125	\$2,000	0.14 yrs
3	Insulate Curing Ovens	1,688 MMBtu	99 Tons	\$14,633	\$9,070	0.61 yrs
4	Install New VFD Compressors	530,157 kWh	203 Tons	\$53,076	\$151,200	2.8 yrs
TOTAL		7,249 MMBtu 668,236 kWh	680 Tons	\$130,609	\$165,654	-

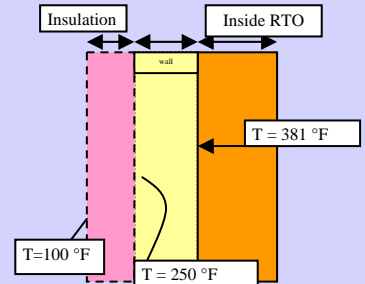
Results:

NJME's current contact at Mauser Corporation has confirmed that Mauser Corporation has successfully implemented four NJME assessment recommendations. The contact also commended the overall quality of the NJME report and recommendations, stating that the technical portions of the report were written with great clarity and logic for any company official to understand. Mauser Corporation is pleased to enjoy the reduced energy consumption and associated cost savings as a result of NJME's assessment recommendations.

NJME strives for quality and excellence to aid small to medium sized manufacturing facilities of New Jersey, such as Mauser Corporation, in identifying strategies for reducing pollution, energy consumption, and CO₂ emissions. With an estimated total of 7,200 MMBtu and 670,000 kWh saved through Mauser's implemented recommendations, 680 tons of CO₂ has been reduced along with a cost savings of \$131,000.

Mauser Corporation has been pleased in working with NJME and has stated that NJME would be recommended to other manufacturing plants in the state in need of an energy conservation and pollution prevention assessment.

Reverse Thermal Oxidizer Insulation



NJME recommended that the surface of the furnace be reduced from 250°F to 100°F, which could be done with 0.5 inch thick fiberboard. While at first alarmingly thin, this thickness of insulation is reasonable considering the change in heat transfer coefficient from un-insulated metal to insulation fiber.

