

## Coating efficiencies focus of March 2009 event

### Inside...

- Nordic Ware increases air make-up efficiency
- Cybex installs cleaning technologies in facility
- Energy efficiency technologies for food processing and metal fabrication facilities

**Manufacturers with industrial finishing operations will have the opportunity to learn about lean manufacturing, improving efficiencies, and new technologies at an event sponsored by the Twin Cities Chapter of the Chemical Coaters Association International (CCAI) and MnTAP.**

In today's global marketplace, operating efficiently is one of the best competitive advantages manufacturers can have. In finishing operations, optimizing the "status quo" is a first step to increasing efficiency. According to Mark Mense of Polaris Industries, that optimization is a prerequisite to any future coating initiatives or equipment investments. Mense will present information about optimizing the status quo at the upcoming 2009

Minnesota Paint and Powder Coating Expo, sponsored by Chemical Coaters Association International (CCAI) – Twin Cities Chapter and MnTAP.

Mense states that there are ten critical areas where coating process design and operational methodology support the potential for optimal coating efficiency and product quality. During his presentation, Mense will provide examples of both positive and negative situations with suggestions and tools for coating process management in each of the ten areas. The information in his presentation will not suggest large investments in equipment or processes, but rather will highlight techniques for working smarter and supporting "creativity over capital."

The Minnesota Paint and Powder Coating Expo will include Mense's technical seminar as well as a number of other sessions that are designed to help coaters improve the efficiency of finishing operations. Attendees are encouraged to attend the Expo to learn about new technologies in product finishing;

find the best coatings, equipment, and techniques; and hear how other companies have improved their coating efficiencies. Additionally, there will be an opportunity for attendees to test the latest equipment in the demonstration area.

In the past, the Expo has featured approximately 60 companies in a vendor show and hands-on demonstrations. This year, the planning committee expects a number of vendors to participate. Additionally, virtual reality spray finishing demonstrations will be available throughout the day for attendees to test their spray technique in a virtual paint booth.

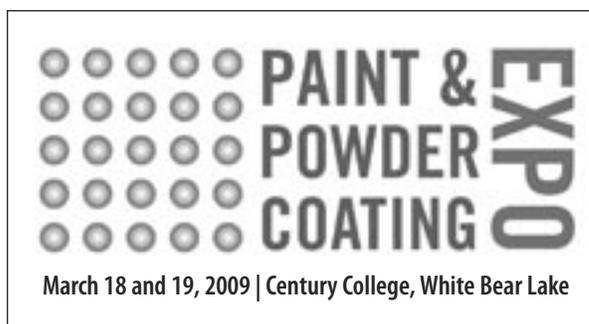
The Expo is part of a two-day event focused on improving industrial finishing operations in Minnesota. The event at

Century College in White Bear Lake kicks off with the Annual CCAI Symposium, hosted by the Twin Cities Chapter on March 18. The Expo, co-hosted by MnTAP, will be held on March 19 at the same location.

During the Annual Symposium, manufacturers will have the opportunity to participate in an all-day

interactive session, Lean Manufacturing for the Finishing Industry, presented by PDG Consultants, a consulting firm specializing in lean transformation. PDG uses the tools of the Toyota Production System and Kaizen methodology and has experience in the finishing industry which allows them to present lean tactics that are specific to various styles of finishing.

More information, including details about specific sessions during the Expo, is available online at <[www.mntap.umn.edu/paintexpo.htm](http://www.mntap.umn.edu/paintexpo.htm)>. Registration for the event will begin in January 2009. ■



### Route:

- health and safety
- maintenance
- owner/president
- process engineer
- purchasing

# Nordic Ware improves air make-up efficiency

Nordic Ware manufactures cookware, bakeware, microwave, and barbecue products. During production, Nordic Ware operates 17 paint booths, six large conveyor cure ovens, and six batch cure ovens. In addition to cookware manufacturing, Nordic Ware operates an industrial coating division, which provides custom surface coating.

Increased manufacturing costs in many areas of the business prompted Nordic Ware to investigate opportunities to reduce energy consumption, not only reduce production costs, but also Nordic Ware's impact on the environment.

## On-Going Work

Nordic Ware is continuing with actions recommended by the intern as feasible. They have started installing some gas unit heaters in another building to eliminate another air make-up during days of non-operation.

A MnTAP intern analyzed the current energy use at Nordic Ware and determined possible energy saving opportunities. One of the areas of focus was the current use of air make-up units in the coating building.

Painting operations continually exhaust air in order to comply with OSHA worker safety requirements and fire safety codes. Exhausted air must be replaced by fresh air from an air make-up unit in order to prevent extreme negative pressure in the building and provide a comfortable workplace for employees.

## Current Practices

Nordic Ware utilized nine air make-up units throughout five buildings to replace the air exhausted from spray painting booths in the coatings area. Prior to the project, some of the air make-up units were running during non-operating hours as a



source of heat, which is an inefficient practice. The air make-up units were capable of heating 350,000 ft<sup>3</sup> of outside air to room temperature every minute, which then was exhausted by the air booth exhaust ducts. Considering the substantial energy and economic costs of heating a large, unoccupied space, the intern recommended that Nordic Ware evaluate heating alternatives to replace the air make-up units as the primary sources of heat.

## Heating Solutions

Based on the coating building's heating requirements, four gas unit heaters with thermostatic controls were added, allowing the three air make-up units to be shut down during non-production times. The gas unit heaters heat room air and force it into the room with a fan or blower, similar to a space heater. In order for the heaters to work properly, Nordic Ware had to install natural gas piping, electrical wiring, and venting for the combustion exhaust. After the heaters were installed, the air make-up units were no longer used as a heat source during non-production hours, resulting in lower natural gas use. Nordic Ware has also updated their shutdown procedures for night and weekends and may consider more integrated control systems when paint lines are upgraded or replaced.

## Maintenance Recommendations

Additionally, the MnTAP intern recommended that Nordic Ware evaluate and perform maintenance on the air make-up units to determine if any units needed repair or replacement. One particular building, the coating building, requires three air make-up units to ventilate the area due to the volume of air being exhausted by the painting processes. Based on the intern's suggestions, Nordic Ware replaced one air make-up unit in the building due to its age and inability to be reliably switched on and off during the heating season. Another air make-up unit in the same building was repaired and the controls were moved to give employees easy access and visual signals regarding the status of the unit.

## Energy and Cost Savings

Modifying and replacing the air make-up units in the coating building as well as installing three gas unit heaters has saved the company approximately \$40,000 and reduced their energy use by 43,000 therms annually.

To read more about the Nordic Ware intern project visit the MnTAP Web site <[www.mntap.umn.edu](http://www.mntap.umn.edu)>. ■

# Cybox installs cleaning technologies in facility

As a manufacturer of premium exercise equipment for commercial and consumer use, Cybox International of Owatonna, Minnesota, is faced with a unique challenge: to produce industrial strength products with a furniture grade appearance. This challenge required Cybox to develop manufacturing processes that ensure high quality products with an impeccable appearance.

Within their facility that opened in 2007, Cybox installed a state of the art electrostatic powder paint system. Parts move from initial metal fabrication through precleaning to welding, abrasive blasting, and finally into an iron phosphate system before being powder coated. Innovations in the precleaning, abrasive blasting, and iron phosphate steps have helped Cybox lessen their environmental footprint while saving money.

## Precleaning

Cybox first cleans its parts to reduce weld spatter and defects in the powder paint area. This is done in a precleaning step, which uses a cleaner to remove machining lubricants, chips, and coolants from inside the tubular parts and from areas that will be welded. This precleaning step, done entirely in the fabrication area, also cuts the amount of welding smoke created and prevents contamination of the steel shot in the next step.

## Abrasive Blasting

Once a part has been precleaned and welded, weld scale, weld smut, and “silicon islands” must be removed from welded parts, as they can cause coating defects and poor paint adhesion. Previously, this material was removed manually.

Today, Cybox actively uses abrasive blasting to clear the parts of the debris and prepare the surface for coating. The abrasive blasting system streamlines this process and allows for more accurate cleaning. An added benefit of the system is that the blasting removes laser oxide that occurs during the laser cutting process.

When developing the new system, Cybox explored the opportunity to use chemicals to remove unwanted material; however, they determined that they did not want to use the strong acids required for the process. Therefore, the company began investigating the abrasive blasting system and toured three facilities that were using the process to determine if it was the right technology.

## Iron Phosphate System

The final step before powder coating the parts is the iron phosphate conversion coating system. Cybox uses a seven stage system with a low temperature iron phosphate chemistry and actively reuses water in the system.

Stages 1 and 2 contain a mild cleaner that includes a rust inhibitor; both stages are heated to 120°F. These stages are designed to remove the shotblasting dust from the parts. The parts are flooded with the cleaning solution to ensure that all unwanted material is removed. At this point, the rust inhibitor is imperative as the blasted steel is reactive.

As the parts are cleaned in stages 1 and 2, significant amounts of contaminants are washed into the solution. Cybox installed a magnetic conveyor belt to remove heavy contaminants as well as a centrifugal filtration system which removes suspended particles from the cleaner, extending the bath life. This extension allows Cybox to reduce chemical use and extend the amount of time between bath cleanings.

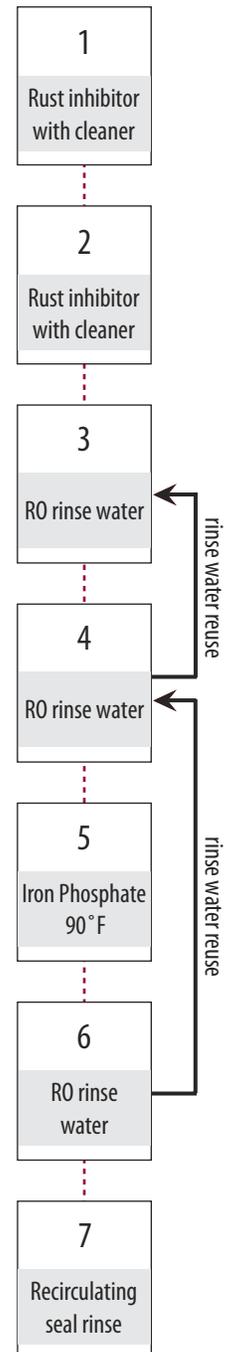
Stages 3, 4, and 6 are Reverse Osmosis (RO) rinse water stages. Stage 3 uses rinse water from Stage 4, which reuses water from Stage 6. These stages are monitored for conductivity. This water recycling system allows the company to reuse the water in the paint process several times and reduces daily waste water from the process to the treatment facility.

Cybox installed two burners in Stage 5, iron phosphate, to allow operation at high or low temperatures. After several trials, the company operates this stage at 90°F and has turned off one burner completely. This temperature is significantly lower than a traditional iron phosphate bath, which can be 130°F or more. The new alternative chemistry has also been adjusted to a more neutral pH, making it safer for employees and reducing the need for neutralization chemicals at the time of disposal. The benefits of their new conversion coating chemistry are real as Cybox has reduced energy consumption while improving the quality and performance of their painted parts.

## Committed to the Environment

Cybox, when designing the facility, undertook a number of initiatives including the new powder paint system. Additional projects include installing windows throughout the building to reduce their energy use by 10% and using energy efficiency lighting that dramatically reduced the number of fixtures needed in the facility without sacrificing light levels. ■

## Iron Phosphate Stages



# Energy efficiency opportunities are available for

Minnesota's manufacturers continue to face a variety of economic challenges, including rising energy costs. Fortunately, there are numerous opportunities available to work with your utility to help reduce those costs by taking steps to increase energy efficiency. In this article, energy efficiency

## Xcel Energy Study

In a study conducted for Xcel Energy, MnTAP examined the energy consumption of the food processing and metal fabrication sectors in Minnesota. MnTAP identified potential energy-use reductions that could result in decreased energy costs for facilities.

MnTAP analyzed sub-sectors to identify energy efficiency opportunities and also identified ways Xcel Energy could provide assistance to these customers. Sub-sectors were ranked by electric use and energy consumption; the top ten sub-sectors were evaluated based on energy consumption plus energy reduction potential and opportunities for achieving reductions. Ultimately, MnTAP recommended that Xcel Energy focus conservation efforts on three sub-sectors in each sector.

opportunities for two sectors (food processing and metal fabrication) are highlighted. Minnesota's food processors and metal fabrication facilities can evaluate these opportunities to take steps toward becoming more energy efficient. The opportunities in this article were identified through a recent study conducted by MnTAP for Xcel Energy (see Xcel Energy Study box, left).

### Food Processing

Within Minnesota, there are more than 150 food

processing facilities, which use an estimated 565 million kWh and 74 million therms annually. While there are specific energy conservation opportunities available for each sub-sector, energy-saving technologies such as refrigeration, pump and fan systems, and combined heat and power could benefit most food processing facilities. Overall, research indicates that facilities could realize 10-15% energy savings by implementing new technologies, such as those included in this article.

### Refrigeration

Refrigeration systems consume a large amount of electricity in food processing facilities. However, impressive savings have been achieved with refrigeration systems; some references quote savings as high as 30% of base electrical usage. Energy and cost savings can be obtained through a variety of modifications to the refrigeration system including improved insulation or tighter seals on doors. More complex changes to the system controls and variable frequency drives for the compressors or evaporator fans can also result in savings.

### Pump and Fan Systems

Pumps and fans can account for up to 15% of the load in various facilities. Pumps are primarily used for cleaning

operations and cooling, while fans are used for ventilation and cooling. When installed, pumps are often oversized to meet a maximum flow requirement; piping, valves, and the rest of the system may be undersized to contain costs. Fans are selected based on price and availability to provide a design air flow, not on energy and operating costs, and are also often oversized.

Both pumps and fans can be evaluated for energy saving opportunities. Pumping systems should be evaluated during the design phase and installation, though there may be retrofit opportunities available for large process pumps that run long hours as well as large cooling towers and HVAC systems. Fan speed should be evaluated; often, oversized fans can be slowed, resulting in a large decrease in energy consumption. Slower fan speed can also reduce fuel consumption. For example, slowing the fan speed can reduce the amount of make-up air needed to be generated.

### Combined Heat and Power (CHP)

CHP provides an opportunity to reduce the overall energy consumption in facilities by generating electricity on-site and recovering waste heat from the electrical generation for the production process. When a facility obtains its electricity from the local utility and generates thermal energy through the combustion of natural gas, the energy conversion process is only 33% efficient. However, using CHP to produce electric energy on-site can result in 80% efficiency.

CHP processes convert waste heat or steam into electrical power. The food industry produces biomass waste, which could be used as an alternative fuel source. CHP, which requires a large capital investment, is an attractive opportunity for food processing facilities that have high energy intensity, a flat year-round load profile, and high thermal to electric ratios. Even facilities with an electrical demand less than 5 megawatts can benefit from CHP systems.

### Metal Fabrication

Metal fabrication has the highest electrical energy consumption and the largest number of Xcel Energy customers in Minnesota. The top ten sub-sectors within the metal fabrication sector account for almost 80% of metered electrical energy and almost 60% of the metered gas consumption.

While there are specific conservation opportunities available to each sub-sector, there are a number of cross-sector technology opportunities that can result in energy conservation for the

# food processing and metal fabrication facilities

metal fabrication industry as a whole. These include improvements to compressed air systems; process heating systems; welding operations; and pumps, fans, and motors.

## Process Motors, Pumps, and Fans

Combined motor, pump, and fan components are sources of 37–47% electrical utility consumption in metal fabrication facilities. Several resources exist that discuss the evaluation and proper sizing of pumps, fans, and electric motors. The Industrial Technologies Program within the Energy Efficiency and Renewable Energy Office at the Department of Energy has sourcebooks available that discuss efficient design factors such as variable frequency drives and maintenance suggestions. Programs to replace older motors could result in energy savings of 2% for every 50-hp motor.

## Welding

Welding operations are common in metal fabrication facilities. A number of recent innovations make welding more energy efficient, including using inverters rather than transformers with rectifiers in the power supply; and monitoring, controlling, and compensating for weld parameter variations to optimize power to the weld.

## Compressed Air

Compressed air is used in metal fabrication for machine power, air tools, and pneumatic valves. Common improvements to these systems include repairing leaks in piping and equipment, reducing the output pressure, using a cold-air intake, setting up remote air receivers, identifying areas with large pressure drops, controlling the loading pattern of the system, and reducing inappropriate uses. More costly solutions include proper sizing and distribution of the system, improving sequencing controls, and installing variable speed compressors.

## Process Heating Systems

In facilities with painting, annealing, and plating operations, process heating comprises a significant amount of gas use and approximately 10% of the electrical utility.

Potential technology improvement areas for these process steps include better insulation, heat recovery from furnaces, reduced cycle times, and minimized soak or stabilization periods. Computerized controls for ovens may also help reduce energy use. Plating and metal finishing baths should be inspected for pipe and tank insulation, as well as proper fitting covers,

which can minimize heat losses from the tanks. Automated cover systems may prove operationally and economically beneficial based on energy costs. Finally, chemical technology in plating and metal finishing is available to allow for lower bath temperatures.

## Moving Forward

The industrial sector analysis work is one step both MnTAP and Xcel Energy are taking to provide energy efficiency assistance to Minnesota's businesses. MnTAP can provide additional resources on the opportunities identified in this article to help Minnesota's businesses save money and improve the environment.

Additionally, Xcel Energy and MnTAP will host a Department of Energy (DOE) motor and fan training on February 3–5, 2009. The training will be conducted by Ron Wroblewski, PE, President of Productive Energy Solutions. Wroblewski has over 20 years of experience in optimizing industrial and commercial energy systems. The training will include the DOE industrial motor systems management course, DOE industrial fan system assessment, and an on-site demonstration of techniques learned.

For more information on energy efficiency and the DOE training, please contact MnTAP at 612.624.1300. ■

## Xcel Energy offers solutions for customers

Xcel Energy offers solutions through studies and rebates for business customers participating in energy conservation programs. When business customers implement study recommendations and qualify for rebates, the resulting energy savings will help them increase their company's energy efficiency, reduce their operating costs and improve their bottom line. The following programs for electric and/or natural gas business customers in Minnesota are especially beneficial for food processing and metal fabricating businesses.

Custom Efficiency offers rebates for installing energy-efficiency equipment or for making process improvements that reduce energy use. This program can help metal fabricators with process heating systems; welding operations; compressed air systems; and process motors, pumps, and fans. Custom Efficiency studies and incentives help food processors save energy and money when they improve the efficiencies of refrigeration systems and pump and fan systems. Additionally, in-depth studies are available through Energy Analysis, Recommissioning, Compressed Air Efficiency, and Refrigeration Recommissioning.

For further information regarding these and other conservation programs, visit <[www.xcelenergy.com](http://www.xcelenergy.com)>. ■

# MnTAP interns make significant contributions

**“It’s always a good thing to have extra help. The MnTAP intern program has always been a very good way of getting projects done that we haven’t had the resources for. Overall, the program really worked out well for me in the past and I hope to continue to call upon MnTAP and the intern program in the future.” - Mike Costello, Atritech, Inc.**

Mike knows the value of a good intern who can address waste issues. He’s hosted three MnTAP interns at a variety of facilities in the last ten years. Each of those interns provided him with practical recommendations for solving waste issues at each facility. Without those interns, Mike says, the waste issues may not have been addressed as staff time is already stretched thin.

If you are facing waste issues that you cannot find the time to tackle, MnTAP can help. A MnTAP intern can evaluate a variety of waste-related challenges including:

- Energy use
- Defects/scrap
- Raw material use
- Wastewater/water use
- Solid or hazardous waste
- Air emissions, VOCs, HAPs

Projects do not broadly assess which wastes need to be reduced; rather, they focus on identifying specific options for reducing wastes already identified as priorities.

## Success in 2008

Are you interested in the recommendations made by 2008 interns? MnTAP has published the interns final public presentations, complete with audio. Visit the MnTAP Web site <[www.mntap.umn.edu/intern](http://www.mntap.umn.edu/intern)> to learn how interns helped seven companies in 2008.



**The 2008 interns, pictured here with MnTAP’s Intern Coordinator Krysta Larson (left), made numerous recommendations to reduce waste at their respective companies.**

Overall, if the companies implement each recommendation, they will realize annual reductions totaling 200,000 lbs of solid waste; 310,000 tons of air emissions; 12 million kWh; 7.8 million gallons of water; 10,000 lbs of hazardous waste; and 47,000 therms. These reductions could total over \$1.3 million annually in cost savings.

## Now Recruiting for 2009

MnTAP is currently recruiting Minnesota businesses to participate in the 2009 summer intern program. In the past, interns have evaluated a variety of waste-related challenges .

## To apply

Applications are due on February 1, 2009. If you would like to discuss a potential intern project, call Krysta Larson at 612.624.4697 or 800.247.0015. Additional information is available online at <[www.mntap.umn.edu](http://www.mntap.umn.edu)>. ■

## Conference to offer sessions for hazardous waste generators

The Minnesota Pollution Control Agency learned from the surveys collected at last year’s Minnesota Air, Waste, Water Conference that hazardous waste content is very important to attendees. Therefore, this year the 2009 Minnesota Air, Waste, Water Conference will be offering more sessions for hazardous waste generators.

The Conference fosters opportunities for professionals in the environmental arena to network, build relationships, and explore new ideas. By bringing together differing viewpoints and discussing the challenges that impact

environmental policy and protection, we will all be able to work more effectively and efficiently to better the environment.

Check the Conference Web site <[www.pca.state.mn.us/news/training/mawweconference/index.html](http://www.pca.state.mn.us/news/training/mawweconference/index.html)> for continual updates on agenda, session details, registration, exhibitor show, and sponsorship. Conference registration begins on December 3, 2008. Conference dates are Feb 10-12, 2009 at RiverCentre in St. Paul, Minnesota. ■



# Materials Exchange

The Minnesota Materials Exchange program lists one company's unwanted material and makes it available for use

by another company. For more information, call MnTAP at 612.624.1300 or 800.247.0015.

## What is Materials Exchange?

The Materials Exchange is a free service that links organizations that have reusable goods they no longer need to those who can use them. This business reuse network helps prevent usable materials from becoming waste and saves users money. In 2007, 582,551 lbs of materials were diverted from the landfill and \$328,915 in avoided purchase and disposal costs.

## Benefits

Use the Materials Exchange program to:

- Receive low or no-cost materials
- Reduce disposal and purchase costs
- Free-up storage space
- Find markets for your surplus materials

## Finding Materials You Need

### Web site

Visit [www.mnexchange.org](http://www.mnexchange.org)

Create user profile

Search wanted/available listings

Contact lister to arrange pick-up

Report success on Web site

### E-mail

Receive the newest wanted and available listings twice a month by e-mail. There are currently over 4,000 e-mail recipients. Visit the Web site to sign up.

### Local Alliance Site

Minnesota is served by eight programs that make up the Minnesota Materials Exchange Alliance. Alliance sites provide local service to an area. Contact the site that covers your area to find out about their program and what their current listings are. Alliance sites include:

- **Chisago County** – 651.213.8380  
Covers: Chisago County

- **MnTAP** – 612.624.5119  
Covers: areas not covered by an alliance site
- **Northcentral** – 218.547.7428  
Covers: Cass, Crow Wing, and Hubbard Counties
- **Northeast, St. Louis County** – 218.749.9703  
Covers: Itasca, Koochiching, and St. Louis Counties
- **Westcentral Minnesota** – 218.299.7329  
Covers: Becker, Clay, and Wilkin Counties
- **Otter Tail County** – 218.998.4898  
Covers: Otter Tail County
- **Southeast Minnesota** – 507.529.4526  
Covers: Blue Earth, Dodge, Freeborn, Mower, Olmsted, Rice, Steele, and Waseca Counties
- **Southwest Minnesota** – 507.532.8210  
Covers: Cottonwood, Jackson, Lac Qui Parle, Lincoln, Lyon, Murray, Nobles, Pipestone, Redwood, Renville, Rock, and Yellow Medicine Counties

## List items

### Web site

Visit <[www.mnexchange.org](http://www.mnexchange.org)>

Choose "create a listing" from navigation bar

Log in or create user profile

Enter item information

Report success on Web site

### Got an exchange?

Please tell us about your success. We track successes to promote the Minnesota Materials Exchange program to others and to show our funders the value of the program. Visit the Web site or call to report your success. ■

## Help us reduce our impact

If half of the subscribers to the *Source* newsletter opted to receive their pollution prevention and energy efficiency news online rather than in printed form, we could reduce our annual environmental impact by:

- 1,500 lbs. CO<sup>2</sup>
- 4,300 gallons of water
- 500 lbs. solid waste

Subscribe today to receive future issues of the *Source* via e-mail. Simply send your e-mail address to [mntap@umn.edu](mailto:mntap@umn.edu). Past issues of the *Source* are available online at <[www.mntap.umn.edu](http://www.mntap.umn.edu)>. ■

# MINNESOTA TECHNICAL ASSISTANCE PROGRAM

UNIVERSITY OF MINNESOTA

helping businesses implement industry-tailored solutions that maximize resource efficiency, prevent pollution and reduce costs and energy use

The Minnesota Technical Assistance Program (MnTAP) helps businesses and industries develop and implement industry-tailored solutions that maximize resource efficiency, prevent pollution and reduce costs and energy use to improve public health and the environment. As an outreach program at the University of Minnesota, MnTAP provides free technical assistance tailored to individual businesses. By reducing waste and increasing efficiency, companies save on disposal and raw-material costs and make working conditions healthier and safer for employees.

MnTAP is funded primarily by the Minnesota Pollution Control Agency's Prevention and Assistance Division and is located at the University of Minnesota in the School of Public Health, Division of Environmental Health Sciences.

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## Calendar

January 13, 2009. **Lean Product & Process Development Workshop.** The Reserve, Plymouth, Minnesota, 8:30 am - 4:30 pm. This interactive hands-on workshop teaches a facilitated team-based design process that uses simple tools combined with the creativity of people to achieve breakthroughs that meet the needs of all stakeholders. Sponsored by Manufacturer's Alliance. For more information, visit <[www.mfrall.com/events/index.asp?type=2#707](http://www.mfrall.com/events/index.asp?type=2#707)>

February 1, 2009. **MnTAP Intern Program Application Deadline.** Each MnTAP intern spends the summer at one Minnesota business researching pollution prevention solutions to improve efficiency, save money, reduce waste or decrease regulatory compliance burden. Company project proposals will be accepted until the program is full. Call MnTAP any time throughout the year to discuss potential projects, 612.624.1300 or 800.247.0015.

February 3-5, 2009. **Department of Energy (DOE) Fan and Motor Training.** University of Minnesota, St. Paul campus. Ron Wroblewski, PE, President of Productive Energy Solutions, will present information that will help your facility optimize fan and motor efficiency resulting in energy and cost savings. The Motor Systems Management training will be presented on the first day and will be followed by Fan Systems Assessment Tool training on the second day. The third day will be an on-site assessment. Participants can attend one or both days, but must attend both days to participate in the on-site assessment. For more information, call MnTAP at 612.624.1300.

March 18 & 19, 2009. **CCAI, Twin Cities Chapter, Annual Symposium & Minnesota Paint and Powder Coating Expo.** Century College, White Bear Lake. The Expo will include a vendor show, hands-on demonstrations, and technical seminars. At the last expo, over 400 participants attended the 15 technical seminars and a vendor show featuring over 50 exhibits. For more information, visit <[www.mntap.umn.edu/paintexpo](http://www.mntap.umn.edu/paintexpo)>.

For more information, visit MnTAP's online calendar at <[mntap.umn.edu/resources/cal.htm](http://mntap.umn.edu/resources/cal.htm)>.

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