

**2015 ROUND 1 PROPOSALS / APPLICATIONS
FOR DANE COUNTY SMART FUND**

**Submitted for Review and Selection by the Sustainability
Subcommittee of the Public Works and Transportation Committee**

Updated March 6, 2015

2015 Application for SMART Funds

Alliant Energy Center

Coliseum Building Mechanical System Upgrades & Adjustments

Department: Alliant Energy Center Address: 1919 Alliant Energy Center Way Madison, WI 53713	Total project costs: \$192,800 Funding amount in current budget: \$0 Funding amount requested: \$192,800
Project Title: Coliseum Building Mechanical System Upgrades and Adjustments	
Project Location: Veterans Memorial Coliseum at the Alliant Energy Center	
Project Description: Upgrade and program adjustments to the building mechanical systems in Veterans Memorial Coliseum based on recommendations contained in the retro-commissioning study that was completed by Sustainable Engineering Group, LLC.	
<ul style="list-style-type: none"> • Install a new web-based lighting control system that that will allow remote access to allow custom scheduling based on event activity. This is currently a manual operation. • Shut down the oil heater for the chiller when it is not used for prolonged periods of time and revised the chiller startup procedures to include activation of the oil heater. • Revise boiler cut-in/cut-out setpoints and tune the burner response to the steam load for one boiler. This should allow for the operation of only one boiler when the demand for steam can be met by the one boiler. This should prevent the unnecessary running of multiple boilers when the demand is not justified. • Conduct a steam trap survey and repair or replace any steam traps that have failed. Leaking streams and hot condensate return temps have been observed which may be a sign of steam trap failure or flash stem in the condensate. A similar survey was completed in 2009 that found approximately 10% of the 202 traps in the Coliseum and Exhibition Hall had failed. • Revise the sequencing of the main air handling unit to prevent simultaneous heating and cooling of the four units that serve the Coliseum bowl area. • Adjust the ice surface temperature to 22 degrees when the ice is not in use. This will result in an increase in the glycol leaving temperature and a corresponding increase in the suction temperature. These temperature increase will significantly increase the overall efficiency of the entire system. • Systematically begin to reduce the ammonia chiller head pressure setpoint to increase the overall system capacity and reduce the motor power required to run the system. This could result in savings of as much as 6%. • If operational changes are not enough to reduce the load on the lead ammonia compressor then a VFD should be installed on the lag compressor to increase its efficiency under light loads. • Replace the individual pneumatic controls in the perimeter heating system with digital thermostats and link their sequences with the building event schedule. The digital controls can then be linked to the building automation system. • Install a warm water recovery system for the ammonia condenser to provide heat for the Zamboni melt pit or to heat to the rest of the Coliseum. • The project will reduce power consumption in Veterans Memorial Coliseum by an estimated 425,800 kW of electricity and 32,769 therms of gas annually. 	

- The projected return on investment based on a \$192,806 expenditure, with energy savings of \$62,034 per year is 3.11 years. Without the 15% contingency, the payback is 2.70 years.
- These improvements are estimated to reduce greenhouse gas emissions by 463.4 metric tons per year.

This project will provide an opportunity to evaluate the recommend building mechanical system upgrades and programming adjustments for applications in other County facilities.

Because our event schedule can vary greatly from one month to the next and one year to the next it is very difficult to measure the outcome of this project. The energy savings estimates used to justify this project are based on estimates provided by Sustainable Engineering Group, LLC as part of the retro-commissioning study they did for Exhibition Hall.

Contact person: Bill Franz

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**Alliant Energy Center
Coliseum Hall Retro-commissioning Study Recommendations
Building Mechanical System Upgrades and Adjustments**

Description	Annual Electric (kWh) Savings	Annual Gas (Therms) Savings	Annual Utility Cost Savings	Total Cost	Payback	Estimated Focus Incentive	Greenhouse Gas Reduction (Metric Tons)
Install Lighting Control Panel	193,556	-	\$24,930.00	\$21,920.00	0.88	\$15,484.48	133.0
Chiller Oil Heater Shut Down	7,760	-	\$999.00	\$450.00	0.45	\$620.80	5.4
Boiler Staging and Modulation Tuning	-	340	\$235.00	\$770.00	3.28	\$169.97	1.8
Conduct a Steam Trap Survey	-	3,937	\$2,716.00	\$3,277.50	1.21	\$585.00	18.0
AHU Heating Sequence Analysis	-	1,587	\$1,095.00	\$1,280.00	1.17	\$793.50	8.4
Ammonia Chiller - Glycol Temperature Reset	115,670	1,981	\$8,307.00	\$1,410.00	0.17	\$10,244.10	90.3
Ammonia Chiller - Decrease Head Pressure	7,500	-	\$473.00	\$1,220.00	2.58	\$600.00	5.2
Install VFD on Ammonia Compressor	101,314	-	\$6,383.00	\$15,010.00	2.35	\$6,250.00	69.6
Perimeter Heating Controls	-	3,345	\$2,007.00	\$9,320.00	4.64	\$1,672.50	17.7
Ice Making Recovery System	-	21,579	\$14,889.00	\$113,000.00	7.59	\$17,262.83	114.0
Total - All Recommendations	425,800	32,769	\$62,034.00	\$167,657.50	2.70	\$53,683.18	463.4
15% Project Contingency				\$25,148.63			
Total Project	425,800	32,769	\$62,034.00	\$192,806.13	3.11	\$53,683.18	463.4

2015 Application for SMART Funds

Alliant Energy Center

Exhibition Hall Building Mechanical System Upgrades & Adjustments

Department: Alliant Energy Center Address: 1919 Alliant Energy Center Way Madison, WI 53713	Total project costs: \$84,500 Funding amount in current budget: \$0 Funding amount requested: \$84,500
Project Title: Exhibition Hall Building Mechanical System Upgrades and Adjustments	
Project Location: Exhibition Hall at the Alliant Energy Center	
Project Description: Upgrade and program adjustments to the building mechanical systems in Exhibition Hall based on recommendations contained in the retro-commissioning study that was completed by Sustainable Engineering Group, LLC.	
<ul style="list-style-type: none"> • Diagnosis and repair a malfunctioning signal control to the secondary chilled water loop pump. Between a mechanical cooling system enable and a freeze protection enable setting the Johnson Controls building automation system sends a shutdown command to the secondary chilled water loop pump. The secondary chilled water loop pump is currently not receiving this shutdown command, resulting in the pump running continuously. Repairing this malfunctioning signal will result in the proper shutdown of the secondary chilled water loop pump when the building automation system deems it appropriate. • Install a variable frequency drive (vfd) on the secondary chilled water loop pump and redesign the chilled water control sequence operational parameters. In addition, modify the pump sequence to control the vfd speed to meet a maximum cold water valve position of 95%, rebalance the secondary chilled water loop for variable flow operation, and check flow rates in the primary cold water and condenser water loops. Currently the secondary cold water pump flow in low speed pump operation is not enough to satisfy some cold water coils at the end of the cold water pipe run, particularly in the meeting rooms. This results in the pump running in its high speed mode regardless of the number of chillers running based on running per the original sequence. In addition, the throttling valve at the outlet of the pump is almost fully closed, possibly restricting the flow rate below its design. • Revise the freeze protection sequence to only start the secondary cold water pump when a freeze stat is tripped. Currently, at an outside air temperature below 40 degrees the secondary chilled water pump is on and the cold water coils are commanded to a 10% open for the purpose of protection the coils from freezing. This has the unintended consequence of causing the heating and cooling in the cold water coils during heating and economizing operation below 40 degrees. The chilled water is being heated up and cooled down depending on the mode of operation the air handling units are in, preventing some units from being able to heat or cool depending upon the cold water loop temperature. • Review oil heater and pump operations, test shutdown of oil heaters and oil pump, and revise operating procedures to include shutdown of oil heaters and pumps. Currently the chiller oil heaters run whenever the compressor is off, including the winter months when immediate startup is not needed. In addition, Chiller 1's oil pump has been running continuously when the compressors were off. • Integrate a chilled water setpoint and demand limiting setpoint within the Johnson Controls building automation system to increase the chiller efficiency during partial load conditions. Currently the chillers are staffed lead/lag with enable/disable points from the building automation system on the local Carrier controllers which control to a constant chilled water 	

supply temperature.

- Confirm the source of a pneumatic control failure and repair or replace the leaking actuator. During heating operation, the heating valves are not closing on the 0% command and the associated air handling unit is overheating its discharge air, causing the air handler to economize to reach its discharge air setpoint. This is resulting in a failure to build pressure in the pneumatic control signal to the face/bypass actuator, and ¼ and ¾ steam valve actuators.
- Conduct a steam trap survey and repair or replace any steam traps that have failed. Leaking streams and hot condensate return temps have been observed which may be a sign of steam trap failure or flash stem in the condensate. A similar survey was completed in 2009 that found approximately 10% of the 202 traps in the Coliseum and Exhibition Hall had failed.
- Revise the economizer sequence such that the economizer is given cooling priority for outside air temperatures between 55 and 65 degrees, with mechanical cooling available for when temperatures rise above the setpoint. This change will extra outside air to be brought in until the 65 degree outside air temperature is reached. Currently free cooling is only enabled when the outside air temperature is below 55F when the mechanical cooling is disabled. The current sequence also shows a 70 degree economizer shutoff.
- Raise the lobby air handler unit switchover point in 5 degree outside air temperature increments to see if low speed operation meets cooling needs. The main hall air handlers units have had their high/low switchover points raised from 55 to 85 degrees outside air temperature to keep them in low speed for a longer period of time. This strategy with the lobby units will result in additional fan savings.
- Redesign the heating and cooling control sequence parameters for the main hall air handling units. This would set all occupied and unoccupied setpoints for the eight units to a set of global setpoints for the mail hall and pair the units that serve a particular hall so they heat or cool in tandem. Sometimes one exhibit hall has a different setpoint than the other halls causing simultaneous heating and cooling of the 8 units that serve the halls. Very small changes in space temperature can cause very large changes in the discharge air temperature setpoint. Setpoints are at 60 degrees in the winter and they are cooling down to the setpoint rather than heating to 68 degrees and allowing the temperature to float once it is above 68 degrees.
- Redesign heating and cooling sequence parameters for the main hall air handling units to revise occupancy sequences for halls A, B, C and D. This redesign will include an analysis of the pressure differences between the halls when only one set of air handlers is running. Currently the occupancy command is linked between the 8 air handler units that serve the main hall for fear the air walls may bow as a result of pressure differences between them. This means that all 8 air handlers must run when only one of the halls is occupied.
- Integrate chiller controls with the building automation system and design chilled water reset control sequence parameters. The chiller control sequences should include cold water supply temperature resets, demand limiting controls, and condenser water resets. Currently the chillers are staged lead/lag with enable/disable points from the building automation system and run on the local Carrier controllers which control to a constant chilled water supply temperature. This project would integrate the chilled water setpoint and demand limiting setpoint on the building automation system.
- Better integrate the local burner control and building automation systems and tune boiler response to meet loads over a range of operating conditions. The current boiler control is set so that the burner controllers are enabled based on a cut-in/cut-out setpoint that is so close that both boilers are firing for much of the time when only one is needed to meet the load. The burner modulation response is also too quick to correctly modulate in the low load conditions to keep the boilers from cycling.
- Determine ventilation rates for events and setup schedules accordingly. Replace pneumatic damper actuators with electric ones and program an optimum start sequence and event and

setup ventilation mode. The minimum outside air rates for the air handling units have been changed from their original design, possibly as a result of poor position control of the dampers by the pneumatic control actuators. The outside air dampers are also unable to be fully economized by some of the air handling units.

- The project will reduce power consumption in Exhibition Hall by an estimated 332,891 kWh of electricity and 23,174 therms of gas annually.
- The projected return on investment based on a \$84,500 expenditure, with energy savings of \$61,120 per year is 1.38 years. Without the 15% contingency, the payback is 1.20 years.
- These improvements are estimated to reduce greenhouse gas emissions by 352.3 metric tons per year.

This project will provide an opportunity to evaluate the recommend building mechanical system upgrades and programming adjustments for applications in other County facilities.

Because our event schedule can vary greatly from one month to the next and one year to the next it is very difficult to measure the outcome of this project. The energy savings estimates used to justify this project are based on estimates provided by Sustainable Engineering Group, LLC as part of the retro-commissioning study they did for Exhibition Hall.

Contact person: Bill Franz

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**Alliant Energy Center
Exhibition Hall Retro-commissioning Study Recommendations
Building Mechanical System Upgrades and Adjustments**

Description	Annual Electric (kWh) Savings	Annual Gas (Therms) Savings	Annual Utility Cost Savings	Total Cost	Payback	Estimated Focus Incentive	Greenhouse Gas Reduction (Metric Tons)
Secondary Cold Water Pump Command	31,293	-	\$4,068.00	\$1,040.00	0.26	\$2,503.00	21.6
Variable Control of Secondary Cold Water Pump	165,557	-	\$21,522.00	\$15,880.00	0.74	\$13,245.00	114.0
Freeze Protection Sequence Revision	7,988	-	\$1,038.00	\$1,230.00	1.18	\$639.00	5.5
Chiller Oil Heater and Pump Shutdown	16,425	-	\$2,135.00	\$830.00	0.39	\$1,314.00	11.3
Repair Steam Valve Actuators	-	6,726	\$5,179.00	\$5,310.00	1.03	\$3,363.00	35.7
Steam Trap Survey	-	7,874	\$6,063.00	\$4,533.00	0.75	\$1,115.00	41.7
Economizer Sequence Revision	54,361	-	\$7,067.00	\$1,420.00	0.20	\$4,349.00	37.5
High/Low AHU Switchover for Lobby	3,608	-	\$469.00	\$390.00	0.83	\$289.00	2.5
Main Hall Heating/Cooling Sequence Revision	-	2,000	\$1,540.00	\$2,320.00	1.51	\$1,000.00	10.6
Split Hall Occupancy Command for Small Events	14,555	-	\$1,892.00	\$2,840.00	1.50	\$1,164.00	10.0
Chiller Control BAS Integration	18,251	-	\$2,373.00	\$10,040.00	4.23	\$1,460.00	12.6
Boiler Staging and Modulation Tuning	-	564	\$435.00	\$1,800.00	4.14	\$282.00	3.0
Ventilation Control for AHUs	20,853	6,010	\$7,339.00	\$25,840.00	3.52	\$4,673.00	46.3
Total - All Recommendations	332,891	23,174	\$61,120.00	\$73,473.00	1.20	\$35,396.00	352.3
15% Project Contingency				\$11,020.95			
Total Project	332,891	23,174	\$61,120.00	\$84,493.95	1.38	\$35,396.00	352.3

2015 Application for SMART Funds
Alliant Energy Center
Exhibition Hall LED Lighting and Lighting Control Panel Upgrade

Department: Alliant Energy Center Address: 1919 Alliant Energy Center Way Madison, WI 53713	Total project costs: \$265,100 Funding amount in current budget: \$0 Funding amount requested: \$265,100
Project Title: Upgrade Exhibition Hall Lights and Lighting Control Panel	
Project Location: Exhibition Hall at the Alliant Energy Center	
Project Description: Replace the existing Exhibition Hall lights with energy efficient LEDs and replace the existing lighting control panel based on recommendations contained in the retro-commissioning study that was completed by Sustainable Engineering Group, LLC.	
<ul style="list-style-type: none"> • Replace the existing 20 decorative torchiere lights in the Atrium and lobby areas that currently have either two 400W or two 250W metal halide lamps. This project would replace the ballasts and rewire the fixtures for an LED retrofit kit. • Replace the existing 227 dimmable 150W incandescent recessed lamps in the Mendota meeting rooms with 23W LED lamps. • Replace the aging lighting control panel that has been experiencing faults with a web-based system that will give staff the flexibility to schedule lighting to better suit actual occupancy and to remotely access the lighting controls. • Replace the existing 184 incandescent recessed lamps in the Atrium and Lobby that have two 23W compact fluorescent lamps each with LED retrofit lamps. • Replace the existing 75 flood lights in the Lake Rooms that currently use PAR 38 90W lamps with LED retrofit lamps. • Replace the existing 53 50W metal halide fixtures and lamps in the outdoor soffits with new LED fixtures and lamps. • Replace the existing 15 wall pack fixtures in the steps around the flag pole area that currently use 50W metal halide lamps with new LED fixtures and lamps. • Replace the existing 24 hanging fixtures in the East-West Corridor that currently use 250W metal halide lamps with new LED fixtures and lamps. • Replace the existing 188 high-bay lights in Halls A through D that currently use 750W metal halide lamps with new LED fixtures and lamps. • The project will reduce power consumption in Exhibition Hall by an estimated 125 kWh of peak demand and 267,824 kWh of annually. • By eliminating lamp replacement the project will keep a significant number of incandescent and metal halide lamps out of the community waste stream. • The projected return on investment based on a \$265,100 expenditure, with energy savings of \$34,819 per year is 7.61 years. Without the 15% contingency, the payback is 6.62 years. • These improvements are estimated to reduce greenhouse gas emissions by 184.8 metric tons per year. 	
This project will provide an opportunity to evaluate new LED technologies for applications at other County facilities.	

Because our event schedule can vary greatly from one month to the next and one year to the next it is very difficult to measure the outcome of this project. The energy savings estimates used to justify this project are based on estimates provided by Sustainable Engineering Group, LLC as part of the retro-commissioning study they did for Exhibition Hall.

Contact person: Bill Franz

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**Alliant Energy Center
Exhibition Hall Retro-commissioning Study Recommendations
LED Lighting and Lighting Control Panel Upgrades Budget**

Location	Lighting Type	Quantity	Unit Cost	Total Cost	Est. Focus Rebate
Atrium and Lobby	Decorative Torchieres	20	\$185.00	\$3,700.00	\$3,621.00
Meeting Rooms	Recessed Incandescents	227	\$35.00	\$7,945.00	\$5,504.00
Atrium and Lobby	Recessed Fluorescents	184	\$61.50	\$11,316.00	\$3,680.00
Lake Rooms	Recessed Incandescents	75	\$46.50	\$3,487.50	\$616.00
Outdoor Soffits	Metal Halides	53	\$52.75	\$2,795.75	\$418.00
Flag Area	Metal Halide Ground Lighting	15	\$106.50	\$1,597.50	\$211.00
Hallways	Metal Halides	24	\$337.50	\$8,100.00	\$840.00
Halls A-D	Metal Halides	188	\$950.50	\$178,694.00	\$11,950.00
LED Lighting Replacement Total				\$217,635.75	\$26,840.00
Lighting Control Panel Replacement				\$12,900.00	\$3,628.00
				\$230,535.75	\$30,468.00
15% Project Contingency				\$34,580.36	\$0.00
Total Project Budget				\$265,116.11	\$30,468.00

**Alliant Energy Center
Exhibition Hall Retro-commissioning Study Recommendations
LED Lighting and Lighting Control Panel Upgrades Savings and Payback**

Location	Lighting Type	Peak Demand Savings (kW)	Annual kWh Savings	Annual Cost Savings	Total Cost	Payback	GHG Reduction (Metric Tons)
Atrium and Lobby	Decorative Torchieres	8	65,520	\$8,518.00	\$3,700.00	0.43	45.2
Meeting Rooms	Recessed Incandescents	27	53,235	\$6,921.00	\$7,945.00	1.15	36.7
Atrium and Lobby	Recessed Fluorescents	5	29,900	\$3,887.00	\$11,316.00	2.91	20.6
Lake Rooms	Recessed Incandescents	4	2,906	\$378.00	\$3,487.50	9.23	2.0
Outdoor Soffits	Metal Halides	2	4,200	\$546.00	\$2,795.75	5.12	2.9
Flag Area	Metal Halide Ground Lighting	1	2,150	\$280.00	\$1,597.50	5.71	1.5
Hallways	Metal Halides	2	2,990	\$389.00	\$8,100.00	20.82	2.1
Halls A-D	Metal Halides	76	61,570	\$8,004.00	\$178,694.00	22.33	42.5
LED Lighting Replacement Total		125	222,471	\$28,923.00	\$217,635.75	7.52	153.5
Lighting Control Panel Replacement		-	45,353	\$5,896.00	\$12,900.00	2.19	31.3
		125	267,824	\$34,819.00	\$230,535.75	6.62	184.8
					\$34,580.36		
		125	267,824	\$34,819.00	\$265,116.11	7.61	184.8

2015 Application for SMART Funds

Facilities Mgt.

Steam convector controls upgrade and trap replacement

Project to involve multiple floors of the City-County Building

Project costs: \$70,789

Funding: \$ 0

Amount Requested: \$70,789

This project will involve the removal of pneumatically controlled steam valves in areas that have had Direct Digital Control (DDC) upgrades within the last eight years. Those valves will be replaced with high temperature electronic valves to complete the DDC conversion. It will also involve the replacement and upgrade of thermostatic convector steam traps and main drips throughout the building.

The City-County Building is heated by steam from the Capitol central power plant. This steam is used directly for heating as well as being converted for domestic and reheat water throughout the building. Because of the intense usage, we have hundreds of steam traps in service that need routine maintenance. In 2012, as a part of a retrocommissioning project, a complete steam trap survey of the building was performed by Badger Thermal Unlimited and the traps found faulty were replaced. The retrocommissioning report recommended the county invest in an ultrasonic testing device and perform testing annually to keep up on trap maintenance. Since the large scale replacement in 2012, we have focused our efforts on upgrade and replacement of traps in project areas but have not ventured out to the older equipment on a large scale. In 2015, Facilities Management purchased an ultrasonic testing device and it has revealed that we have at least a 60% failure rate on our thermostatic radiator traps in older, non renovated areas of the building. The priority would be to replace these traps keeping a record of the trap number and location to apply for Focus On Energy incentives after the project is complete to reimburse the County.

Another area of our steam system we are looking to upgrade are the main drips. The traps we currently use are an inverted bucket type trap which have great longevity but have greater steam losses on systems that modulate. This is exactly the type of system used in the CCB. An automatic valve opens and closes via the BAS which looks at outside air temperature to determine the command. This cycling causes the traps to loose their prime and leak steam until enough condensate is built up. Because of this we are looking to upgrade to a float and thermostatic type trap which will require increased routine maintenance but eliminate the low load losses associated with the current bucket traps. The failure rate on these main drips is anticipated to be relatively low. I do not see a lot of reimbursement from Focus on this portion of the project but records will be kept to apply for funds on what we find to be bad.

The third part of this project would involve the conversion of the pneumatically controlled zone valves to DDC. Many areas in the building have been upgraded to DDC control over the years but due to lagging actuator technology the pneumatic valves were kept. There now is a valve that can be used in a high temp application that is reliable and has been

implemented in the recent first floor remodel of the building. The use of this valve solves the problems inherent to pneumatics. Valves stuck either open or closed, weak springs, pneumatic leaks and uneven office temperatures are very common in areas using older technology. More importantly, it will give us a manual shut off at each convector. We currently are unable to replace a steam trap in the heating season without shutting down heat to the entire building due to the lack of a means to isolate the system. Replacing and upgrading the valves will give us complete capability for isolating an individual heating unit and allowing us to make the repair immediately without affecting anyone else in the building. This ability will save steam, time, and keep the heat on to everyone else regardless of the outside air temperature.

The following is a breakdown of the cost savings that can be expected from complete implementation of the three heating upgrades.

1. There are roughly 450 thermostatic radiator traps building wide that are more than two heating seasons old. A random sampling with an ultrasonic tester has revealed a failure rate of about 60%. This would put the number of traps in need of replacement at 270.

270 traps X \$36.00 per repair kit = \$9,720 to purchase B&J 4270 trap kits
 40 traps / day = 6.75 working days to install
 \$440 / day X 6.75 = \$2,970 for labor to install all thermostatic kits
\$12,690 total parts and labor

* Existing 270 traps failed
 Average steam loss, lbs/yr = 7,095,600
 \$/lb Steam = .01
 Annual energy cost = \$70,956
 Proposed Average Proposed lbs steam/yr = 1,773,900
 Annual Energy Cost = \$17,739

Savings Savings in lbs Steam/yr = 5,321,700 or 55,451 therms
Annual cost savings = \$53,217

*These calculations follow the calculations table used by Sustainable Engineering Group in our retrocommissioning report from 2012, page 77.

2. There are 50 main drip traps of the inverted bucket type which do not work as efficiently on low pressure systems with varying condensate loads like the CCB system. The following is a cost breakdown and payback analysis of this part of the project.

50 main drip traps X \$130.00 per trap = \$6,500 to purchase B&J FTI-2000 trap

6 traps / day = 8.3 working days to install
\$440 / day X 8.3 = \$3,666 for labor to install all main drip traps
\$10,166 total parts and labor

Theumling Industrial has run calculations on cost savings in efficiency by converting our inverted bucket traps to F&T type traps.

Inverted bucket with 3/16 orifice could waste 25.1 lbs/hr or .25 therms.
50 traps X .25 therms = 12.5 therms/day X 180 day heating season = 2,250 therms/yr
2,250 therms = 215,943 lbs steam/yr X .01\$/lb = **\$2,159 annual cost savings**

3. There are 150 wall convectors throughout the building serving spaces that have been renovated and the zones are now controlled by DDC devices on the Building Automation System (BAS). Many of these convectors still have the 1955 control valves still in place that are pneumatically controlled. By linking these valves electronically to the BAS we will experience more balanced heat distribution and 100% shutoff capability with manual override for maintenance. System trending will be more accurate as we eliminate a pneumatic conversion and there will be a reduction in run time on our controls compressors as load is removed from the system. Reduced maintenance and system performance are the main cost savings of this portion of the project with employee comfort being an added bonus. The usage of space heaters should decrease when the convectors are more responsive but putting a number on this is nearly impossible.

140 zone valves X \$175 per valve = \$24,500 to purchase Belimo valves
2000' 18-3 control wire = \$500
Tech time for valve spanning = 16 hrs @ \$150/hr = \$2,400
Install labor @ 3 valves/day = 373 hrs @ \$55/hr = \$20,533
Total Valve Cost = \$47,933

It is estimated that we receive between 60-70 work orders per year relating to valves being stuck, leaking or pneumatically failed. I anticipate this number will be reduced by 50% since there are still many areas without DDC control.

35 work orders @ 1 hour labor avg = **\$1,925 in labor savings**

Total Project Costs = \$70,789

Annual Projected Savings = \$57,301 or 57,701 therms = 5,528,643 lbs steam

Simple Payback = 1.29 years

Energy Equivalent savings would be 189 tons of coal, 1,539,781 kWh of electricity or 46,203 gallons of gasoline.

Focus On Energy incentive is \$50.00 / trap and will be submitted in two separate applications. The thermostatic trap costs of \$9,270 should be fully covered by FOE. The main drip traps have a much lower failure rate of less than 10% so I am not anticipating any more than \$300 in FOE funding for this portion of the project. If we receive the full reimbursement for the thermostatic traps the payback will be reduced to one year.

Work on this project will be completed by Dane County Facilities Steamfitters. Only one day of tech time from Johnson Controls and Environmental Systems will be needed for signal spanning in select areas. All of the major components removed by this project will be recycled, leaving very little scrap to be sent to the landfill. The steam traps are all stainless steel and cast iron construction. The control valves are bronze and cast with some steel components. All of these parts will be sent to All Metals Recycling and the checks will be made to the Dane County Treasurer.

Measurement and Verification:

All measurement and verification for this project will be done by Facilities Management. There will be a separate file set up to log convactor related work orders for comparison to prior years. It will also let us establish a baseline to gauge the upgrades to the remaining non-renovated areas of the building to see how beneficial the conversion is for comfort issues and mechanical failures. The steam usage will be measured from the condensate meter located in the ground floor mechanical room. This meter is the property of the State of Wisconsin, and it is what is used to bill the county monthly. We will be able to compare records from years past, and post project, to track reductions in condensate produced very easily. This M&V will require the state to keep its meter functional and calibrated.

The person responsible for managing this project and keeping record of all payback data will be Todd Draper.

**2015 Application for SMART Funds
Public Works - Solid Waste Division
Landfill Shop Lighting**

Department: Public Works - Solid Waste Division Address: 7102 U.S Highway 12& 18, Madison, WI 53713	Total project costs: \$6,300.00
	Funding amount in current budget: \$0
	Funding amount requested: \$6,300.00
Project Title: Landfill Shop Lighting	
Project Location: Dane County Landfill Site #2 – 7102 U.S. Highway 12 & 18, Madison, WI 53713	
Project Description: Purchase and install 12 lighting fixtures running at 104W	
<p>Describe how the proposed project moves the county toward meeting the following Sustainability Principles. (See the guiding questions in the box below.) Responses to this section will be used to determine the relative level of sustainability for each project.</p> <ul style="list-style-type: none"> • Reduce and eventually eliminate county government’s contribution to fossil fuel dependence and to wasteful use of scarce metals and minerals; • Reduce and eventually eliminate county government’s contribution to dependence upon persistent chemicals and wasteful use of synthetic substances; • Reduce and eventually eliminate county government’s contribution to encroachment upon nature and harm to life-sustaining ecosystems (e.g., land, water, wildlife, forest, soil, ecosystems); and • Reduce and eventually eliminate county government’s contribution to conditions that undermine people’s ability to meet their basic human needs. <p>Include in your description any estimated reductions of GHGs / CO2 equivalent emissions related to your proposal. Please use the following calculator to do this: http://www.epa.gov/cleanenergy/energy-resources/calculator.html</p> <p>Installation of 12 LED lighting fixtures at this landfill shop building will be an effective and cost efficient means of reducing the overall energy consumption of the building. Currently, 12 lighting fixtures are working at 400 W increasing the energy consumption of the overall building. The addition of new energy efficient lighting fixtures will reduce the money spent on electricity and dependence on fossil fuels. As a result, the County will be reducing emission of greenhouse gases and other pollutants. By reducing the energy consumption by an estimated 262 therms per year, the County will eliminate 5.29 metric tons of carbon dioxide equivalents in terms of energy consumption by ending the expensive practice of inefficient lighting fixtures.</p> <p>This project is estimated to save the County \$2009.00 a year in energy expenses from the reduction of electricity consumed. At an estimated project cost of \$6,300.00, the project will have a 3.1 year return on an investment, after which the County will be saving money as a result of this project.</p>	

Describe how the county might build upon the outcomes of the proposed project to work toward greater sustainability.

By getting in the practice of ensuring efficient lighting, the County can effectively improve its efficiency in terms of energy and resource use. In a broader sense, by prioritizing efficient use of energy, the county can do a great deal to reduce and eventually eliminate its dependence on polluting fossil fuels.

Describe how your department will track and measure outcomes of the proposed project (i.e., annual cost savings, annual energy savings, resource use reductions, maintenance reductions, etc.). Include a timeline for measurement and reporting outcomes, and the staff member contact who is responsible for conducting the tracking and measurement.

The outcome of the project will be directly apparent in the utilities billing for the building and the reduction in the electricity bill. Annual electricity costs at the building shall be compared to electricity cost during 2014 and the cost reduction shall be attributed to the replacement of lighting fixtures.

Contact person: **John Welch**

Phone: **608.516.4154**

E-mail: **welch@countyofdane.com**

March 2nd, 2015

2015 Dane County Departmental SMART Funding Request Recycled Rubber Playground Chips-Dane County Parks

Project Overview

Dane County Parks is seeking funding to purchase recycled rubber playground safety chips for installation around existing and new playgrounds throughout the Dane County Park system. Historically Dane County Parks has been using ground wood chips for playground safety surfacing primarily because the initial material cost is substantially less than recycled rubber playground chips.

For cost comparison, Dane County Parks spends approximately \$23,000 for 1320 cubic yards of wood chips every four years for playground surfacing material. Because recycled rubber playground chips are a much more shock absorbing material, they can be applied at about ½ the depth of wood chips, or 660 cubic yards at an estimated cost of \$96,760. Recycled rubber playground chips have an approximate 15 year lifespan, as opposed to a maximum of 4 (weather dependent) for wood chips, so the material cost is fairly comparable over a 15 year timeframe.

The significantly less depth of surfacing material required when using recycled rubber results in a number of environmental benefits. Less trucking is required to deliver the product to Dane County Parks, and also results in fewer trips by operations staff to replenish/topdress playground safety surfacing. Also, playground surfacing material is typically loaded and installed by diesel skid steer loaders, a 50% reduction in required material would result in major reductions of diesel fuel consumption and greenhouse gas emissions.

Dane County Parks has 12 parks that have modular playground equipment that require annual woodchip playground maintenance. Parks maintenance staff use 2 trucks to haul playground chips and equipment from 4318 Robertson Road to the parks in the spring of the year. Assuming a 15 year lifespan for recycled rubber versus a 4 year lifespan for wood chips, conservatively would result in 2 fewer system wide annual topdressing maintenance events over the 15 year time period. The total round trip mileage estimates from 4318 Robertson Road to all of the 12 parks using MapQuest is 415 miles, or 830 miles for 2 trucks. Using an estimated 15 mpg fuel efficiency for both trucks results in approximately 55 gallons of fuel consumption per annual playground maintenance topdressing event. Conversion to recycled rubber would result in 2 fewer annual topdressing maintenance events, or a reduction of 110 gallons of fuel consumed. 110 gallons of gasoline per year is equivalent to 0.978 metric tons of CO₂ equivalent emissions annually, or approximately 15 metrics tons of CO₂e emissions reduced over the 15-year life of the recycled rubber chips. The EPA Clean Energy Calculator estimates 8,887 grams of carbon dioxide emissions per gallon of gasoline consumed, therefore conversion to recycled playground chips conservatively would result in a 977,570 gram reduction in carbon dioxide equivalent emissions.

Playground chips are made from 100% recycled rubber and provide superior drainage that allows rainwater to infiltrate much better than compacted wood chips. They provide a soft surface to help keep children safe on the playground and help reduce the stress on joints and bones. Recycled rubber playground chips exceed standards set by the U. S. Consumer Product Safety Commission and are made from non-toxic, environmentally-friendly materials approved by the EPA. They inhibit growth of molds and fungi, thereby reducing allergy risk. At five times heavier than wood mulches, rubber mulch will not float, absorb water or erode during heavy rain and flooding.

If awarded this grant, Dick Black, Parks Operation Manager, will track amount of trucking, labor and topdressing material required for each maintenance event.

2015 Application for SMART Funds

LWRD-Parks Division

Recycled Rubber Playground Chips

Department: LWRD-Parks Division	Total project costs: \$96,760
Address: 5201 Fen Oak Drive Room 208 Madison, WI 53718	Funding amount in current budget: \$0
	Funding amount requested: \$96,760
Project Title: Recycled Rubber Playground Chips	
Project Location: Dane County Park System	
Project Description: Purchase recycled rubber playground chips for safety fall zone surfacing at new and existing playgrounds throughout the Dane County Park System. (See attached.)	
<p>Describe how the proposed project moves the county toward meeting the following Sustainability Principles. (See the guiding questions in the box below.) Responses to this section will be used to determine the relative level of sustainability for each project.</p> <ul style="list-style-type: none">• Reduce and eventually eliminate county government's contribution to fossil fuel dependence and to wasteful use of scarce metals and minerals;• Reduce and eventually eliminate county government's contribution to dependence upon persistent chemicals and wasteful use of synthetic substances;• Reduce and eventually eliminate county government's contribution to encroachment upon nature and harm to life-sustaining ecosystems (e.g., land, water, wildlife, forest, soil, ecosystems); and• Reduce and eventually eliminate county government's contribution to conditions that undermine people's ability to meet their basic human needs. <p>Include in your description any estimated reductions of GHGs / CO2 equivalent emissions related to your proposal. Please use the following calculator to do this: http://www.epa.gov/cleanenergy/energy-resources/calculator.html</p>	
Describe how the county might build upon the outcomes of the proposed project to work toward greater sustainability.	
Describe how your department will track and measure outcomes of the proposed project (i.e., annual cost savings, annual energy savings, resource use reductions, maintenance reductions, etc.). Include a timeline for measurement and reporting outcomes, and the staff member contact who is responsible for conducting the tracking and measurement.	
Contact person: Chris James	Phone: 608-224-3763 E-mail: james@countyofdane.com

2015 Application for SMART Funds

Juvenile Court Program

Appliance update

Department: Juvenile Court Program	Total project costs: \$13,800
Address: 210 Martin Luther King Jr Blvd Rm 200	Funding amount in current budget: \$0
	Funding amount requested: \$13,800
Project Title: Appliance update	
Project Location: Juvenile Shelter Home--2402 Atwood Ave	

Project Description:

This project is designed to upgrade the very old kitchen appliances at the Juvenile Shelter Home. By updating these appliances, significant electricity and natural gas savings should be realized. These appliances are used for food storage and preparation for the residents of Shelter Home. The program has around 300 juveniles placed in the home each year and all meals are prepared by staff and residents onsite. The refrigerators and freezer are all 15-20 years old and a repair company actually estimated the stove to be nearly 80 years old. It was a used appliance from the start of when the nuns occupied the building in the 1960's. All of these appliances are quite inefficient and have needed ongoing repairs over the years.

We have secured a variety of bids/prices on the appliances. Following is specific information about the Energy Star rated items, including anticipated savings based on their website calculator:

1. Replace the current two door commercial refrigerator with an Nor-Lake Model unit from Kessenich's-- \$2,800. The anticipated five year electricity savings is \$445. The estimated cost for this unit is \$2,700.
2. Replace the current household refrigerator/freezer with a 18 cu. ft. Frigidaire from Brothers Main. The anticipated five year electricity savings is \$310. The estimated cost for this unit is \$600.
3. Replace the current upright freezer with a 20 cu. ft. Frigidaire from Brothers Main. The anticipated five year electricity savings is \$305. The estimated cost for this unit is \$800.
4. Replace the current chest freezer with an approximately 25 cu. ft. model from a local retailer. The anticipated five year electricity savings is \$165. The estimated cost for this unit is \$600.
5. Replace the current range with a high performance residential BlueStar unit from Kessenichs. As stated above, the age of the range is estimated to be nearly 80 years old and many parts are in poor condition (see included photo). The current unit has a continual pilot light and the unit radiates heat at all times. The consumerenergycenter.org website indicates that pilot lights account for 30% of the natural gas used by these appliances, so I would anticipate a reduction of 30% of natural gas usage with the electronic pilot light unit. The current unit also has a very damaged seal and there is a great deal of heat lost as a result when using the oven for food preparation. Estimates are that it would be costly to repair the seal. The estimated cost for this unit is \$5,720.
6. Replace the current island range hood with a Broan unit from Kessenichs. The current unit was installed when the facility was built in the early 1960's and it is in very poor condition (see included photo). Despite regular professional cleanings, it is inefficient in drawing air and thus collects grease and residue much too quickly. The resulting concerns about vent fires causes this unit to be used sparingly. There will be electricity savings as a result of the more efficient fan and it will actually exhaust cooking fumes. The estimated cost for this unit is \$2,611.
7. Delivery, installation and contingency costs are estimated to be \$500.

Describe how the proposed project moves the county toward meeting the following Sustainability Principles. (See the guiding questions in the box below.) Responses to this section will be used to determine the relative level of sustainability for each project.

- This project will reduce electricity usage, expense and thus will reduce carbon emissions.
- This project will reduce natural gas usage by at least 30% when comparing the proposed range vs the existing range.
- This project will save resources by minimizing repair costs due to the new units and warranties.
- This project will use local vendors for the appliances, which helps with the local economy.
- This project will further demonstrate to the youth of the facility that energy efficiency is an important consideration. Shelter staff will have discussions with the youth about the benefits of energy efficiency and sustainability and will be able to use the replacement appliances as examples once the comparison data is tabulated. Staff had these discussions with the youth during the last project to replace the toilets, faucets, etc. with low water usage models.

Include in your description any estimated reductions of GHGs / CO2 equivalent emissions related to your proposal. Please use the following calculator to do this: <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>

Describe how the county might build upon the outcomes of the proposed project to work toward greater sustainability.

The outcomes should demonstrate that by updating older appliances in county facilities, greater energy efficiency will result.

Describe how your department will track and measure outcomes of the proposed project (i.e., annual cost savings, annual energy savings, resource use reductions, maintenance reductions, etc.). Include a timeline for measurement and reporting outcomes, and the staff member contact who is responsible for conducting the tracking and measurement.

We will be able to measure actual wattage used for the new appliances and compare this data to the new units after they are installed. We will also be able to compare the total household electric bill pre and post installation. Following is actual wattage used by the existing appliances multiplied to equal one year of kilowatt usage and the listed annual kilowatt usage for the proposed new appliances:

- Standup refrigerator freezer-496 kilowatts used. The new model uses 363 kilowatts for a 27% reduction.
- Standup freezer-689 kilowatts used. The new model uses 480 kilowatts for a 30% reduction.
- Chest freezer-298 kilowatts used. The new model uses 275 kilowatts for an 8% reduction.
- Commercial two-door refrigerator-663 kilowatts used. I was unable to find information on the estimated kilowatt usage of the new model, so we will need to measure this after installation. It would be safe to assume that the reduction would be comparable to above and be in the 25-30% range.
- Using a reduction of 25% for the commercial unit, all total there would be a reduction of 531 kilowatts of electricity per year. This is estimated to reduce carbon emissions by .366 metric tons or the equivalent or burning 393 lbs of coal per year.

The gas usage for the range will be a challenge given the other gas uses in the facility for the boiler heater and new water heater. We will also be able to compare previous repair costs for the appliances, which should be zero. The annual repair costs currently are approximately \$1,000 for all of the units combined. Suzanne Stute and John Bauman will be responsible for measuring and reporting outcomes.

Contact person:
John Bauman

Phone: 283-2925
E-mail: bauman.john@countyofdane.com

2015 Application for SMART Funds

Dane County Sheriff's Office

Hostage Negotiations Team (HNT) van replacement

Department: Dane County Sheriff's Office (DCSO)

Address: 115 W Doty St
Madison, WI 53704

Project Title: Hostage Negotiations Team (HNT) van replacement

Project Location: 115 W Doty St, Madison, WI 53704

Total project costs: \$55,000

Funding amount in current budget: \$0.00

Funding amount requested: \$55,000

Project Description:

DCSO HNT requests \$55,000 for the purchase of a 2015 Ford Transit Bi Fuel van to replace our existing 2005 Ford E350 Super duty van. The project will describe the current DCSO HNT Van and how a new Compressed Natural Gas (CNG) bi fuel van would improve the gas mileage and reduce harmful environmental emissions. Additionally, this project outlines potential savings, environmental footprint reductions, and ways of tracking monetary and fuel savings.

Describe how the proposed project moves the county toward meeting the following Sustainability Principles. Responses to this section will be used to determine the relative level of sustainability for each project.

Reduce and eventually eliminate county government's contribution to fossil fuel dependence and to wasteful use of scarce metals and minerals

DCSO has Van #48 assigned to the HNT. The van is a 2005 Ford Econoline E350 super duty. The engine is a 255 horsepower 5.4 liter V8. Heavy Truck Technicians from Kayser Ford have estimated the van gets between 12 miles per gallon (mpg) and 15 mpg. The 10 year old van currently has 102,857 miles on it. In addition to its high mileage, it also has also spent hundreds of hours idling during Tactical Response Team (TRT) and HNT call outs and training exercises.

A new HNT van would not require a 5.4 liter V8 engine that produces 255 horsepower. A vast majority of the time, HNT uses Van #48 as a place to gather information and speak with subjects in crisis. The equipment HNT uses such as computers, specialized phones and other

monitoring equipment is powered by electricity. It is necessary for the vehicle to idle in order to power the equipment and keep the vehicle's battery from failing. A CNG vehicle would better suit the needs of DCSO as they are quieter while idling.

A vehicle assigned to HNT must perform for long periods of time during all types of weather conditions. HNT can be called upon at any time to respond to high risk calls. The team has been deployed up to 16 hours and there is potential to be deployed longer. Vehicles assigned to DCSO specialized teams are utilized in extreme conditions so dependability is an important factor. At present time, Van #48 must be continually hooked up to a trickle charger when not in use.

In February, 2015, Van #48 was turned off during a two hour deployment briefing. After the briefing, Van #48 did not start. Fortunately, the briefing was held at the Fitchburg Police Department and a jump start got the vehicle started. The worst case scenario would have been the van would not have been able to be driven to the crisis site and negotiators would have needed to find alternative transportation. Additionally, HNT would have had to move several pieces of equipment essential to the performance of their duties. This inevitably would have delayed the response.

A 2015 Ford Transit van offers a CNG capable 3.7 liter V6 engine. The Ford Motor Company considers Wisconsin to be a "Cold Weather" state so it cannot offer a CNG only model. The Ford Transit would be equipped with two tanks; one utilizing gasoline and the other with CNG. CNG has an octane rating of 130 compared to regular grade gasoline's rating of 87. CNG and gasoline have similar ranges. HNT will not experience a decline in performance compared with vehicle #48 due to increased engine technology.

Reduce and eventually eliminate county government's contribution to dependence upon persistent chemicals and wasteful use of synthetic substances

Natural gas vehicles (NGV) cost less to maintain because CNG burns very clean. NGV show significantly less engine wear, spark plugs last longer, and oil changes are needed less frequently. Mufflers and pipes on NGV last longer because CNG does not react with the metals of these components. In some vehicles, miles driven between oil changes can be extended to 25,000 miles.

Reduce and eventually eliminate county government's contribution to encroachment upon nature and harm to life-sustaining ecosystems

As mentioned above, van #48 has 102,857 miles on it. A Kayser Ford Heavy Truck Technician has estimated it gets between 12 and 15 mpg. Table 1 shows the estimated gallons of gas of gasoline used under optimal driving circumstances, not including vehicle idling. Total miles are divided by the vehicle's estimated mpg.

Table 1

Veh #48 Miles	Veh #48 Estimated Miles Per Gallon *	Estimated Gallons of Gasoline Used
102,857	/ 12	8571.416
102,857	/ 15	6857.133

*Estimates based on information provided by a heavy truck's technician at Kayser Ford, Madison, WI.

Table 2 shows the environmental impact burning 8571.416 and 6857.133 gallons of gasoline has on our environment. The figures are based on information from the Environmental Protection Agency's (EPA) website, <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>.

Table 2

Veh #48 Estimated Gallons Used	Metric Tons of Carbon Dioxide Emitted*	Barrels of Oil Used*
8571.416	76.2	177
6857.133	61	142

* According to <http://www.epa.gov/cleanenergy/energy-resources/calculator.html> based on 8571.416 gallons and 6857.133 gallons of gas used.

Table 3 multiplies the average US gas prices from 2005 through 2014 by the total miles on vehicle #48.

Table 3

Veh #48 Miles	Average US Gas Prices (2005 to 2014)*	Estimated Total Gasoline Cost
102,857 x	\$3.0153	\$310,144.71

* According to http://www.eia.gov/totalenergy/data/monthly/pdf/sec9_6.pdf, average United States gas prices from 2005 to 2014 were \$3.0153 per gallon.

As previously mentioned, the tables shown above do not include the hundreds of hours Van #48 has spent idling. The metric tons of carbon dioxide emitted, barrels of oil used, and the estimated gasoline cost would all be much higher than the tables show. According to the EPA, 8571.416 gallons of gasoline used would need to be offset by 1,954 tree seedlings grown for 10 years.

BIO CNG, a natural gas refining company, advises replacing a typical older vehicle with a new NGV vehicle reduces exhaust emissions in the following ways:

- Carbon monoxide (CO) reduced by 70-90 percent
- Non-methane organic gas (NMOG) reduced by 50-75 percent
- Nitrogen oxides (NOx) reduced by 75-95 percent
- Carbon dioxide (CO2) reduced by 20-30 percent

Reduce and eventually eliminate county government’s contribution to conditions that undermine people’s ability to meet their basic human needs.

There is no greater human need than preservation of life. DCSO has organized special teams to provide a coordinated law enforcement response to situations involving persons in crisis, suicidal subjects and/or barricaded subjects.

DCSO deems high risk calls to be: hostage situations, armed barricaded subjects, sniper situations, jail disturbances, dignitary protection, dangerous arrest situations, high risk warrant service, armed suicidal subjects and other special assignments. The specialized team approach protects the safety of hostages, innocent persons, and law enforcement personnel. The HNT provides Dane County residents in crisis and their loved ones an opportunity for a safe and peaceful resolution.

In addition to preservation of human life, this project has the potential to save Dane County thousands of dollars in fuel costs. According to CNG NOW, a compressed natural gas advocacy group, average CNG prices on 02-15-2015 for the State of Wisconsin were \$2.12 per gallon of gasoline equivalent (GGE). According to a 2013 Dane County press release, the average cost of Dane County’s CNG is \$1.25 GGE.

Table 4

Vehicle 48 Miles		Fuel Price	Fuel Type	Total Cost
102,857	x	\$3.0153	Gasoline (Reg)	310,144.71
102,857	x	\$2.12	CNG (WI Avg)*	218,056.84
102,857	x	\$1.25	CNG (Dane Co)**	128,571.25

* <http://www.cngnow.com/average-cng-prices/pages/default.aspx>, on 02-15-2015, average CNG prices in the State of Wisconsin are \$2.12.

**<https://www.countyofdane.com/press/details.aspx?id=3206>

If DCSO and HNT kept a CNG vehicle for the next 10 years and put 102,857 miles on it as was done with Van #48, the county saves \$181,573.46. That is enough money to purchase three 2015 Ford Transit vans.

Describe how the county might build upon the outcomes of the proposed project to work toward greater sustainability.

Van #48 is a 2005 Ford F350 Super Duty 11 passenger van used during high risk police calls by the Dane County Sheriff’s Office Tactical Response and Hostage Negotiations teams. It has a V8 engine that produces 255 horsepower that spends a great deal of time idling. During the course of its use, it has burned well over 142 barrels of oil and produced well over 61 metric tons of carbon dioxide. A 2015 Ford Transit CNG van would be a much better solution.

This project will be successful. There is no greater benefit to the citizens of Dane County than Dane County Deputies arriving safely and timely at an active scene to preserve life and property. A reliable CNG van will benefit everyone in Dane County simply because of the nature of the work being done.

A new CNG van will benefit the DCSO and the HNT because of the safety and reliability benefits of CNG over conventional gasoline. The natural gas ignition point is 1,200 degrees Fahrenheit, twice that of gasoline. Natural gas will not combust in concentrations below five percent and above 15 percent. Spilled or leaking gasoline will pool and can pose a significant threat if ignited. NGV cylinders are subjected to a number of federally required "severe abuse" tests, such as heat and pressure extremes, gunfire, collisions and fires. If a CNG tank is punctured, the contents will dissipate in the air.

A new CNG van will be used in every village, town, and city in Dane County. A new vehicle has the potential to be used by the DCSO Special Events Team (SET) during Halloween, the Mifflin Street block party, and possibly large scale protests. TRT and HNT will use it for training and high risk calls. The van will be prominently featured in community events such as National Night Out, Cambridge's Touch a Truck, Madison's Safety Saturday, parades, and at the public safety career fair at the Alliant Energy Center. The significant exposure to the community will help open a dialogue with Dane County residents about CNG vehicles.

A 2015 Ford Transit CNG van utilizes the most up to date technology available in a CNG vehicle. It will save Dane County taxpayers thousands of dollars in fuel bills. It will preserve waterways and clean air. It can prevent soil contamination due to the dramatic reduction in carbon dioxide emissions and fossil fuels burned. The DCSO fleet budget will benefit by significantly reduced maintenance costs on a new 2015 CNG vehicle compared to a 10 year old van with over 100,000 miles on it.

A NGV will excel in the role of being assigned to a DCSO specialized team. CNG will prove itself under the most extreme conditions while being safer and better for the environment. The fuel savings and reliability will influence decision makers hesitant to switch from a traditional gasoline based fleet to NGV.

Describe how your department will track and measure outcomes of the proposed project (i.e., annual cost savings, annual energy savings, resource use reductions, maintenance reductions, etc.). Include a timeline for measurement and reporting outcomes, and the staff member contact who is responsible for conducting the tracking and measurement.

DCSO will retain the abovementioned information on Van #48's miles per gallon, average gas price, metric tons of CO2 dispersed and barrels of oil that were burned. In reference to a new NGV, DCSO will record information associated with CNG tank fill ups for the next five years. In addition, hours idled and miles driven will also be recorded. The Dane County Sheriff's Office recognizes a new vehicle is a huge investment. Extra care will be exercised to ensure information will be transparent and provided in an efficient manner.

DCSO Lt. Alecia Rauch will be responsible for documenting the fuel usage and subsequently reporting this information to the Dane County Department of Administration (DOA). Lt. Rauch is the Fleet Manager for DCSO and is the HNT Team Leader. The tracking will be done on a

quarterly time period on an Excel spreadsheet as provided by Baker Tilly Consulting in 2014. The timeframe can also be determined based on the reporting requirements of DOA. Additionally, the impact this vehicle has on the environment will be tracked using the following website, <http://www.epa.gov/cleanenergy/energy-resources/calculator.html> .

2015 Application for SMART Funds

Dane County Sheriff's Office
In-House Jail Laundry Project

Department: Dane County Sheriff's Office Address: 115 W. Doty Street Madison, WI 53703	Total project costs: \$925,000 Laundry
	Funding amount in current budget: \$650,000
	Funding amount requested: \$209,100
Project Title: In-House Jail Laundry Project	
Project Location: Public Safety Building and Ferris Center	
<p>Project Description: The Sheriff's Office currently contracts with a private provider for the laundering of inmate linens and uniforms. Inmate non-issue personal items are currently laundered on premise, utilizing inmate labor. Changes in DOC 350 mandates more frequent laundering of inmate linens, uniforms, and non-issue personal items which necessitated a contractual revision with the laundry service private provider and resulted in an increase in 2015 expenditures, significantly increasing cost to the County. This change provided the impetus for the Sheriff's Office to explore the possibility of bringing all laundering services on-premises. Further, it supports all facets of the County's Sustainability Principles and most importantly affords inmates the opportunity to learn marketable skills in laundry service, positioning them for more successful reintegration into the community.</p>	
<p>Describe how the proposed project moves the county toward meeting the following Sustainability Principles. (See the guiding questions in the box below.) Responses to this section will be used to determine the relative level of sustainability for each project.</p> <ul style="list-style-type: none"> • Reduce and eventually eliminate county government's contribution to fossil fuel dependence and to wasteful use of scarce metals and minerals. • Reduce and eventually eliminate county government's contribution to dependence upon persistent chemicals and wasteful use of synthetic substances; • Reduce and eventually eliminate county government's contribution to encroachment upon nature and harm to life-sustaining ecosystems (e.g., land, water, wildlife, forest, soil, ecosystems); and • Reduce and eventually eliminate county government's contribution to conditions that undermine people's ability to meet their basic human needs. <p><i>The Sheriff's Office believes that this project is consistent and compatible with all four of the County's Sustainability Principles in terms of both goals and objectives. Please reference the attached Exhibit 1 for details on how this project moves the County toward sustainability.</i></p> <p><i>We have included in Exhibit 1, estimated reductions of GHGs / CO2 equivalent emissions related to this proposal.</i></p>	

Describe how the county might build upon the outcomes of the proposed project to work toward greater sustainability.

The current operation of outsourcing laundry is adequate in that it achieves the goal of supplying clean linens to the inmate population. However, the costs of outsourcing laundry will likely continue to rise. Bringing all laundering services on-premises and leveraging the inmate labor force, will not only provide inmates with a marketable skill upon release, but also will reduce cost. We know that the current practice regarding on-premises laundering of inmate personal items is not only costly, but is inefficient in terms of energy and utilities. This proposal provides an opportunity to make a real impact that will be felt for years to come.

Bringing laundry services on-premises is a viable program that can be expanded to other types of vocation skills and training opportunities. Jail industries teach inmates job skills and work ethic, which allows them the opportunity to succeed once they leave our care. In turn, this could reduce recidivism. Most jail industries are self-sustaining. Further, green initiatives that adhere to the County's Sustainability Principles would be implemented based on the outcomes of this proposed project.

Describe how your department will track and measure outcomes of the proposed project (i.e., annual cost savings, annual energy savings, resource use reductions, maintenance reductions, etc.). Include a timeline for measurement and reporting outcomes, and the staff member contact who is responsible for conducting the tracking and measurement.

The annual contractual cost of contracting with an outside provider for laundering services in 2015 is expected to be \$216,400 and will likely continue to rise. Bringing all laundering services in-house, leveraging the inmate labor force not only provides inmates with a marketable skill, but will also contain and reduce cost in the future. The current cost of the laundering of inmate personal laundry is currently not calculated, but we know it is inefficient. Under the proposed plan, inefficiencies in this area are addressed and will likely result in further cost savings. The annual re-occurring costs associated with bringing laundering services in-house, in terms of chemicals, maintenance and replacement linens is estimated to be around \$70,000. Cost savings in terms of energy and utility efficiencies gleaned is currently unknown.

To track and measure outcomes associated with this project, we are proposing the following:

A water meter is being installed on the washing machines in the Public Safety Building to track current water consumption. A baseline for natural gas consumption for the Public Safety Building will be derived from billing during the summer months as natural gas is currently not used elsewhere in the buildings during this period. (During cold weather, there are some Air Handling Units that use natural gas.) The Sheriff's Office utilizes natural gas also in the City County Building Jail (CCB) for laundering purposes. Public Health is the only other consumer of natural gas in the building, however their use is minimal. A baseline will be established for this building by obtaining billing documentation from the Department of Administration. This project eliminates all laundering in the CCB as laundering for both downtown facilities will be handled for the Central Laundry. The Sheriff's Office has purchased an Electric Meter to track electrical use on the washers and dryers to obtain a baseline on energy consumed.

We have reached out to our third party vendor regarding the card operated machines to obtain baseline data. We are researching energy and water consumption for the existing equipment and will use the number of loads purchased as a basis of calculation. Usage of the existing machines in the city county building will be tracked for a one week period as usage is relatively stable. This will then be applied to the energy guidelines for the specific pieces of equipment.

Contact person: Captain Richelle Anhalt

Phone: (608)284-6165

E-mail: Anhalt.richelle@danesherriff.com

Exhibit 1 - SMART Fund Application

Describe how the proposed project moves the county toward meeting the following Sustainability Principles. (See the guiding questions in the box below.) Responses to this section will be used to determine the relative level of sustainability for each project.

- Reduce and eventually eliminate county government's contribution to fossil fuel dependence and to wasteful use of scarce metals and minerals.
- Reduce and eventually eliminate county government's contribution to dependence upon persistent chemicals and wasteful use of synthetic substances;
- Reduce and eventually eliminate county government's contribution to encroachment upon nature and harm to life-sustaining ecosystems (e.g., land, water, wildlife, forest, soil, ecosystems); and
- Reduce and eventually eliminate county government's contribution to conditions that undermine people's ability to meet their basic human needs.

The Sheriff's Office currently contracts with a third party vendor for the provision of inmate laundering services of inmate linens and uniforms. Inmate laundry is picked up and delivered to the Public Safety Building 5 days per week with additional service to the Ferris Center two days per week. Moving all inmate laundering services in-house would eliminate the need for transportation from their facility to the jail facilities and potentially juvenile detention as they contract with the same vendor. This would result in a reduction of approximately 220 gallons of gasoline each year. The resultant sum of greenhouse gas emissions reduced is equivalent to two metric tons of Carbon Dioxide Equivalent.

Inmate personal laundry is handled through a separate process and is currently handled in-house. In the City-County Building (CCB) Jail, inmate personal laundry, in mesh bags, is collected weekly by the inmate workers. It is taken to the laundry room where it is washed in the individual mesh bags independently from each other. Multiple mesh bags are not laundered together as the bags often come open or tear resulting in claims against the County. This practice is not only very inefficient, but is costly as well. Recent changes to DOC 350 include a provision that all issued and allowable clothing be laundered twice weekly. The requirement of twice weekly laundering exacerbates the current inefficiencies in the system. To promote efficiency, reduce energy and water consumption as well reduce chemical use, the Sheriff's Office is proposing that all personal laundry be issued to the inmates. Currently, family members are allowed to bring personals to the jail. This presents an opportunity for the introduction of contraband into the facilities and promotes theft. Issuing personal items reduces the likelihood of contraband being smuggled into the facility and limits the opportunity for theft of personal property. In addition, it is designed to mitigate claims and promote efficiency. More importantly, the need to launder the mesh bags independently is eliminated thereby allowing increased load size, promoting efficiency along with having a positive environmental impact.

There are card operated washers and dryers in the Public Safety Building and at the Ferris Center. Inmates must purchase laundry cards for laundering of all non-issued items. The Public Safety Building was designed as a work release facility. While there are some Huber inmates housed in the Public Safety Building, the majority are not. The Sheriff's Office laundry proposal eliminates the card operated fee based washer and dryer for non-Huber/work release areas. Laundry from these areas would be handled by the Central Laundry. The current practice is inefficient. Inmates are not allowed to combine clothing with another inmate's clothing as it can place an inmate in a disadvantaged position. As a result load size is small which results in a higher consumption of both water and electricity. As all personal items would be issued and belong to the County, there is no advantage to having inmates in these areas

Exhibit 1 - SMART Fund Application

continue to do their own laundry. Revenue from laundry is minimal. We believe that changing to this process will be more cost effective in the long run due to energy and water savings. Because Huber inmates need to have access to work clothing the process for Huber inmates would remain unchanged.

Equipment and process selection are crucial components of designing the facility laundry. The Sheriff's Office is committed to the utilization of products, services and processes that encourage environmental stewardship. Ozone laundry technology is an effective tool in helping to reduce water usage and energy consumption while also reducing wash and dry times, ensuring the absence of microorganisms, and improving the quality and useful life of laundered products. Traditional laundry services use hot water to aid chemical activation and provide thermal disinfection. Ozone cold water wash systems achieve these objectives, while reducing a facility's energy consumption and extending linen life by as much as 20%. In addition, steps within a wash cycle can be shortened and some even eliminated, which reduces overall water use, electricity, and cycle times. These reductions allow facilities to be more efficient, allowing personnel to provide labor for other tasks.

With oxidizing power 3,000 times more effective than chlorine, ozone is the most powerful oxidizer and disinfectant commercially available that can be safely used in water treatment. Due to the instability of the ozone molecule, it is generated at the point of use and is easily converted back to oxygen. When ozone gas is introduced to an environment with bacteria, mold or any other organic material, it readily donates one of the oxygen atoms in its structure to oxidize or destroy that material effectively eliminating 99.9 % of superbugs, such as MRSA.

One of the environmental advantages of ozone laundering is that it significantly reduces the use of chemicals. This not only provides a cost incentive, but an environmental incentive by decreasing the discharge of chemicals in laundering waste waters. Further, higher levels of dissolved oxygen in laundry wastewater are beneficial to the County's lakes, rivers and streams.

The following summarizes the benefits of utilizing ozone in the laundering process:

- 1. Reduces the amounts of chemicals and rinse water used.*
- 2. Decreases the amount of chemicals discharged into the environment.*
- 3. Dissolved ozone remaining in laundry discharge, converts to dissolved oxygen upon contact with dissolved organic materials which benefits microorganism in natural waters and sewage treatment plants.*
- 4. Ozone oxidizes organic soils on laundry. These materials are then more easily biodegradable by microorganisms.*
- 5. Less chemicals present less hazard as smaller volumes are stored and handled.*

The Tulsa County Sheriff's Office reported reduced cost directly resulting from the use of ozone in their laundering processes. They reported a reduction in hot water usage from 161 gallons to 24 gallons for each machine on each wash. That translated to an 85% reduction in hot water usage and a 30% decrease in overall water usage.

In summary, this project will reduce electric energy consumption due to the higher efficiency of the washers and dryers. The Milnor washers are of rugged construction and design and feature RinSave which reduces rinsing resulting in reducing time and 15% WATER CONSUMPTION. Because laundry would be handled within the facilities, transportation is eliminated which resulting in gasoline savings and a reduction in greenhouse gas emissions.

Exhibit 1 - SMART Fund Application

This project also meets the fourth sustainability principle in that it reduces the County government's contribution to conditions that undermine people's ability to meet their basic human needs. An in-house laundry provides an opportunity for inmates to learn a skill that will situate them transition into the community. The Sheriff's Office has been working with Workforce Development on a certification program for laundering services. This opportunity positions inmates well for jobs in the community particularly those pertaining to healthcare linens and the hospitality industry. It is our hope that through partnership with Workforce Development we can identify employers in these fields that are willing to hire former inmates with experience in the field.

Budget *The total equipment budget for this project is **\$209,100**. Please see Laundry Equipment Budget.*

Additional information regarding the proposed Ozone System and equipment as well as the budget quotation is included for additional information.

	Ferris Center	Public Safety Building
Miles Round Trip	5.51	6.27
Trips/Week	2	5
Miles/Week	11.02	31.35
Miles/Year	573.04	1630.2
TOTAL MILES/YEAR	2203.24	

GALLONS OF GAS/YEAR 220.324

ANNUAL REDUCTION IN CO2 EMISSION IN GRAMS 1,958,019.39
[2 metric tons CO2e]

*8887 Grams of CO2/ gallon of gasoline consumed per the Greenhouse Gas
Equivalencies Calculator

PSB - Central Laundry

Milnor Softmount Washer-Extractors Model 36026 X8R Quantity (3) @ \$39,500	\$ 118,500
Milnor Dryers Model M122 Quantity (3) @ \$10,500	\$ 31,500
Fire Suppression (3) @ \$200	\$ 600
Ozone System (1) @ \$22,000	\$ 22,000

Subtotal PSB - Central Laundry \$ 172,600

Ferris Center - Facility Laundry

Milnor MWR-Series Model MWR12X5 Washer-Extractor (1) @ \$6300.00	\$ 6,300
Milnor Model M50V Gas Heated Dryer	\$ 4,800

Subtotal Ferris Center Facility Laundry \$ 11,100

PSB - Huber Card Operated Laundry

Huebsch Model HFNBYSR Front-load Card Ready (6) @ \$2,150	\$ 12,900
Huebsch Model HDEY Card-Ready Electric Dryer (6) @ \$1,025	\$ 6,150

Subtotal PSB Huber Card-Ready \$ 19,050

Ferris Center - Huber Card Operated Laundry

Huebsch Model HFNBYSR Front-load Card Ready (2) @ \$2,150	\$ 4,300
Huebsch Model HDEY Card-Ready Electric Dryer (2) @ \$1,025	\$ 2,050

Subtotal Ferris Center Huber Card-Ready \$ 6,350

TOTAL \$ 209,100

INCLUDES freight, delivery, set/level equipment in place, anchor/grout washers



AF-Tower Series

Aquawing Ozone Laundry Systems



The Aquawing Difference

Patented Validated Ozone Disinfection (VO3) – How do users know that they are receiving the correct amount of ozone? VO3 technology notifies users that microbiologist recommended levels of ozone have been achieved and maintained for the proper amount of time. This patented technology ensures efficiency and disinfection.



Patented Variable Ozone – Patented variable ozone takes readings from each washer 60 times per second and automatically adjusts ozone levels to the precise amount of ozone needed for each washer.



Aquawing Ozone Laundry Systems are engineered for durability, long-life and ease-of-use to deliver years of trouble-free operation using less utilities. It is this commitment to quality that enables Aquawing to back its products with warranties that are among the best in the industry



Features

- Dramatic utility savings
- A greener laundry option
- Clinically Validated bacteria kill of OVER 99.999%^{oo}
- Validated kill of the superbugs MRSA, Aspergillus niger, C. diff. and many more
- Patented variable ozone injection
- Patented Validated Ozone (VO₃)
- Surpasses all OSHA safety standards
- Quick & easy install
- Minimal space requirements
- 2-year warranty on all parts Inclusive of the patented Aquawing Injection System

Specifications

- Height: 76"
- Width: 25"
- Depth: 22"
- Capacity: up to 4 washers per tower or wall unit
- Washer Type: Adaptable to any washer
- Minimal maintenance needed
- Special Hookups: No special hookups required
- Plumbing Hookups: No special plumbing required



The Secret

Patented Interfusor

“With this system we find that linen is a lot brighter, a lot cleaner, and smells like outdoors...”

-Walter Ohanian, Administrator of Christopher House

Variable Ozone makes the difference. Aquawing is the only system that maximizes ozone's cleaning ability and antibacterial strength by delivering the correct amount of ozone needed, when it's needed.

Aquawing's patented variable ozone technology adjusts the amount of ozone in the wash according to the load size and amount of soil in the linen. The Aquawing System is the only system that has this capability, and *it is all done automatically!*



Herb
LAUNDRY & DRYCLEANING EQUIPMENT
Fitzgerald co.

Herb Fitzgerald Company

Toll Free (800)686-3489

(262)783-5808

www.herbfitzgerald.com

The Aquawing System

is the advanced, new system now being released by Aquawing, the leaders in ozone technology. Aquawing is the synthesis of Aquawing's patented injector and verified disinfection technology.

This revolutionary, OSHA validated system is helping facilities reach new levels of safety, security and efficiency while reducing laundry costs.

Aquawing is field tested and has proven its superior reliability and effectiveness time and time again. As a result of its superior quality, Aquawing technology has taken ozone capabilities to new heights and is storming the laundry industry.



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Savings

Patented Interfusor

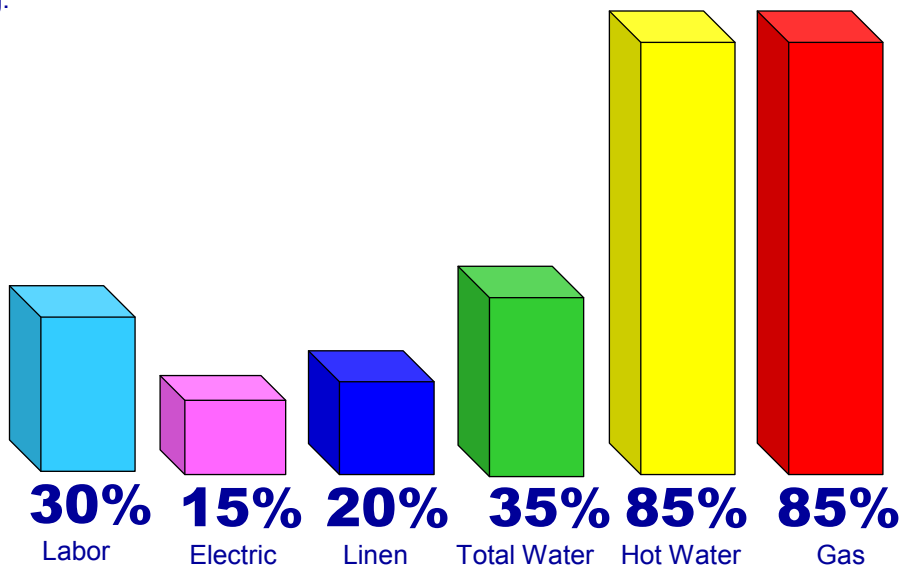
Aquawing

is essential to any successful laundry operation. One of the abundant reasons for customer success is the drastic savings that Aquawing offers.

Aquawing dramatically cuts utility and labor costs largely thanks to its ability to process laundry with mostly cold water and its ability to cut cycle times. Combined with proper use and good practices, savings can be as high as the following:

Saving you

- Saves Time & Money
- Uses less water, electricity, gas & detergent
- Shorter Wash Cycles
- Shorter Dry Time
- Extends Equipment Life
- Extends Linen Life
- Kills 99.999% of the superbugs
C.diff, Asperigillus niger, MRSA, HIV, and Hepatitis



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Disinfection

Patented Interfusor

Killing Superbugs

Verified Disinfection is a unique aspect of Aquawing, which verifies a 99.999% kill of the superbugs C, diff, *Aspergillus niger*, MRSA, HIV, and Hepatitis.

Superbugs MRSA, *C. diff*, and *Aspergillus niger* are not killed through traditional wash processes. **Aquawing is the only system that provides verification in killing these Superbugs & it's achieved on ALL wash cycles.**



Dr. Richard Neale, B.Sc, PhD, MIChemE

Laboratory Results

Conducted by D.O'Conner B.Sc.Ci.Biol M.I.F.S.T. Microsearch Microbiologists

Test 1 - European suspension test - 2.5 min, BS EN 1997/BS EN 1276 1997

Results: Organisms MRSA, *C. diff*, *Aspergillus niger* - **TOTAL KILL - NO VIABLE TRACE**

Test 2 - Wash Process

Results: Organisms MRSA, *C. diff*, *Aspergillus niger* - **TOTAL KILL - NO VIABLE TRACE**

**Conducted by Dr. Richard Neale, B.Sc, PhD, MIChemE,
Laundry Technology Center.**

Test 3 - Onsite wash processing in a 90 bed care home

Results: Organisms MRSA, *C. diff*, *Aspergillus niger* - **TOTAL KILL - NO VIABLE TRACE**

** Full report available upon request*

Herb Fitzgerald Company

Toll Free (800)686-3489

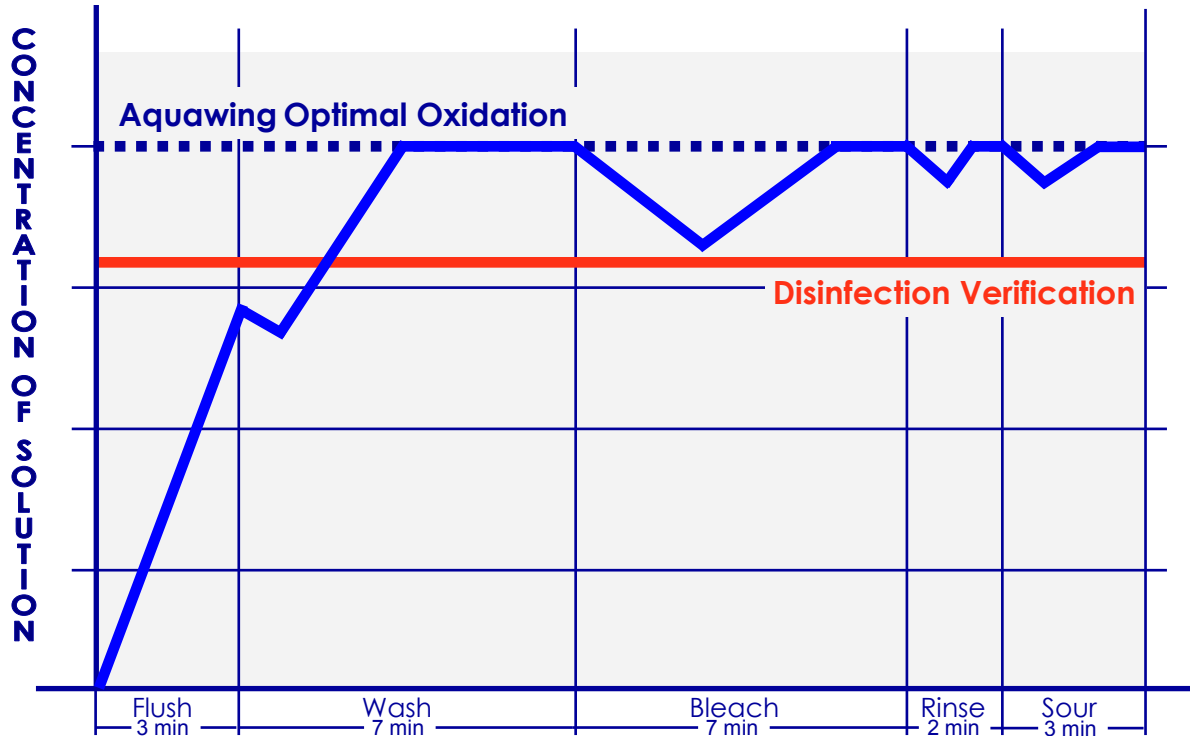
(262)783-5808

www.herbfitzgerald.com

Validation

Patented Interfusor

Verified Ozone Disinfection



Aquawing's verified disinfection technology kills bacteria including the Superbugs **MRSA, Aspergillus niger, C. diff., HIV, and Hepatitis**

99.999% KILL



*Typical Pad Cycle

Disinfection Verification:
EEC standards - 2.5 min

Concentration of solution for complete disinfection is considered proprietary information



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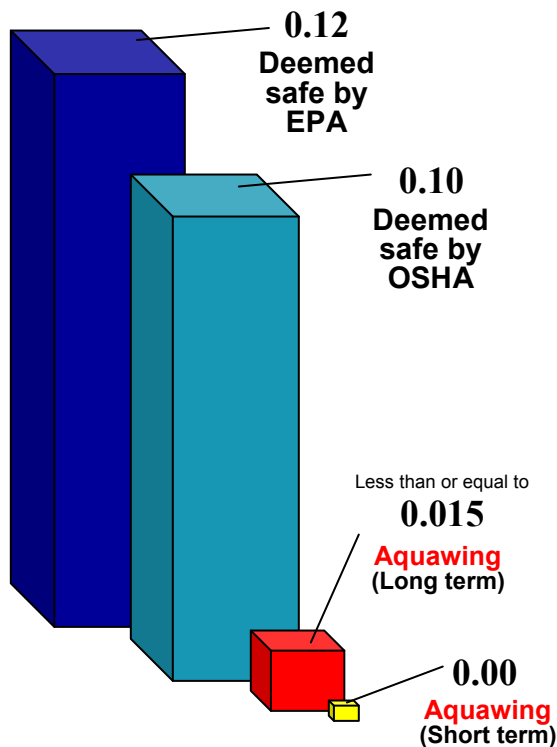
Safety

Patented Interfusor

Aquawing easily meets OSHA guidelines and provides an increased level of safety for residents, guests, employees and our environment.

The Aquawing system is a safer alternative to traditional wash processes. The Aquawing system:

- Meets stringent OSHA regulations
- Protects workers and residents from all harmful bacteria, including the superbugs *C .diff*, *MRSA*, and *Aspergillus niger*, *HIV*, and *Hepatitis*.
- Environmentally safe:
 - Uses less energy
 - Uses significantly less total water
 - Produces fewer gallons of waste water
 - Improves sewage quality



“[Aquawing] Ozone contamination is NOT a potential health hazard for workers in the laundry room...”

-Department of Health

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Go Green

Patented Interfusor

This is a truly wonderful system that allows facilities to save a great deal of energy and water and bring their laundries into the Green era. Moreover, facilities see consistently low ROI's, so they're saving the environment and money.

- **Save up to 35% on total water**

Ozone activates the wash water allowing it to be more efficient and thereby using less water. Facilities use less which enjoying the savings on their water & sewer bills.

- **Reduce hot water up to 85%**

The Aquawing system allows users to wash in mostly cold water, which brings drastic reductions in energy usage

- **Eliminating Bacteria**

Aquawing is the only clinically validated system guaranteed to kill over 99.999% of the super bugs MRSA (staph), C diff and aspergillus niger. The system is doctor approved to prevent HIV and all strains of Hepatitis from surviving the wash process.

- **Reduce Chemical Waste**

Ozone has the substantial ability to energize laundry chemicals. This allows chemistry to be more effective and more efficient, reducing the chance of excess chemicals finding their way into our environment.





February 25, 2015

DANE COUNTY JAIL
CAPTAIN RICHELLE ANHALT
115 WEST DOTY ST, #2002
MADISON, WI 53703

Re: Laundry Equipment Budget

Dear Captain Anhalt,

I am pleased to present the following budget quotation for laundry equipment at the Dane County Jail and associated facilities.

The main laundry at the Public Safety Building will feature large capacity, industrial-grade machinery, including Milnor washers and dryers and an Aquawing Ozone System.

Quoted are options for both softmount and rigidmount washers. Milnor industrial washers are true, heavy-duty washers. They are world renowned for their industry-leading rugged construction and design, featuring solid-plate steel construction, continuous welding, and tapered roller bearings aligned in rigid housing to maximize machine life. All Milnor washers feature MILNOR's exclusive **RinSave**[®], which can replace as many as two rinse steps, saving up to 10 minutes per load and 15% of water consumption. Water savings with 80 and 100-lb. washers are estimated at 26 and 33 gallons per wash cycle, respectively.

The quoted Aquawing Ozone system is sized to service three (3) total washers, up to 101-lb. capacity each. This is the only ozone system available that uses patented variable ozone injection. A sensor is constantly monitoring and regulating the ozone levels in the wash wheel to ensure optimal ozone levels, guaranteeing proper cleaning and bug kill with each wash.

The Ferris Center will feature a small, lighter-duty commercial grade Milnor washer and complimentary dryer.

For the Huber Facility and City County Building, Huebsch "small-chassis" machines are quoted. These are residential-sized, commercial-grade washer and dryers. The Huber Facility machines will be card-ready, while the CCB machines will be "push-to-start."

Please consider the following detailed information. I am available to meet at your convenience to discuss this equipment in further detail.

PUBLIC SAFETY BUILDING LAUNDRY EQUIPMENT:

WASHERS-EXTRACTORS:

Option A: Softmount Industrial-Grade Washers (100-lb. Capacity)

3 MILNOR X-SERIES model 36026 X8R with the following features:

- 100 lb. capacity, 7-speed suspended washer-extractor
- 36" x 26" (15.3 ft³) stainless steel cylinder
- 766 RPM Extract → 300 G-Force
- RinSave® water saving technology
- MilTOUCH-Ex Touchscreen Microprocessor
 - 30 programmable wash cycles w/ load counter
 - Can be programmed via PC and USB flash drive
 - Universal digital temperature control
 - Programmable cool down, bath/overnight soak
- Two-Point Inverted SmoothCoil Suspension System
- Single motor inverter drive controls all machine speeds
- Liquid supply injection signals and connection ports



Subtotal (ea.)

\$39,500.00

Extended TOTAL (3)

\$118,500.00

Option B: Rigidmount Industrial-Grade Washers (80-lb. Capacity)

3 MILNOR V-SERIES model 36021 V7Z with the following features:

- 80 lb. capacity, 7-speed washer-extractor
- 36" x 21" (12.37 ft³) stainless steel cylinder
- 766 RPM Extract → 300 G-Force with ExactXtract
- RinSave® water saving technology
- MilTOUCH Touchscreen Programmable Microprocessor
 - Can be programmed via PC and USB flash drive
 - Universal digital temperature control
 - Programmable cool down, bath/overnight soak
- Single motor inverter drive controls all machine speeds
- Liquid supply injection signals and connection ports



Subtotal (ea.)

\$22,800.00

Extended TOTAL (3)

\$68,400.00

PUBLIC SAFETY BUILDING LAUNDRY EQUIPMENT (continued):

DRYERS:

3 MILNOR model M122 with the following features:

- 120 lb. capacity, gas-heated dryer
- 44-1/8" x 40-9/16" (35.9 ft³) steel cylinder
- Microprocessor control with auto-dry
- Radial airflow
- **REVERSING** basket
- 415,000 BTU/hr input; 2,800 cfm airflow
- Four-Point Roller Support System



Subtotal (ea.)

\$10,500.00

Extended TOTAL (3)

\$31,500.00

Optional Fire Suppression (+\$200 ea.)

+\$600.00

OZONE SYSTEM:

1 AQUAWING model AF-3 Tower with the following features:

- One (1) tower unit with three (3) ozone generators to serve up to three (3) 101-lb. capacity MILNOR washers
- Generates *4 grams of ozone at 8% concentration* (each washer)
- Produces a minimum of *1.00 PPM* ozone in washer water
- **Variable Ozone Injection** control continuously regulates ozone levels to ensure cleanest laundry possible and provide clinically-validated 99.999% bug kill rate every wash
- **VO3 Validated Ozone Control** verifies that the machine has reached the proper level of ozone during the wash cycle



TOTAL (1)

\$22,000.00

TOTAL (PSB LAUNDRY EQUIPMENT: OPTION A – Softmount)

\$172,600.00

TOTAL (PSB LAUNDRY EQUIPMENT: OPTION B – Rigidmount)

\$122,500.00

FERRIS CENTER LAUNDRY EQUIPMENT:

- 1 MILNOR MWR-SERIES model MWR12X5 with:**
- 25 lb. capacity, 3-speed washer-extractor
 - 23" x 14" (3.37 ft³) stainless steel cylinder
 - 525 RPM Extract → 90 G-Force
 - E-P XPRESS Microprocessor
 - 30 pre-programmed wash cycles w/ load counter
 - Single motor inverter drive controls all machine speeds
 - Liquid supply injection signals and connection ports



TOTAL (1)

\$6,300.00

- 1 MILNOR model M50V with the following features:**
- 50 lb. capacity, gas-heated dryer
 - 32-3/4" x 37-1/2" (18.3 ft³) steel cylinder
 - Microprocessor control
 - 150,000 BTU/hr input; 750 cfm airflow



TOTAL (1)

\$4,800.00

TOTAL (FERRIS CENTER LAUNDRY EQUIPMENT)

\$11,100.00

HUBER FACILITY LAUNDRY EQUIPMENT

<u>8</u>	HUEBSCH model HFNBYR Front-Load Card-Ready Washer	
	<ul style="list-style-type: none"> • 3.42 cubic feet capacity • 1,200 RPM Extract • Electronic rear control panel • Pump drain • 120/60/1 electrical service 	
	Subtotal (ea.)	\$2,150.00
	Extended TOTAL (8)	\$17,200.00

<u>8</u>	HUEBSCH model HDEY Card-Ready Electric Dryer	
	<ul style="list-style-type: none"> • 7.0 cubic feet capacity • Electronic rear control panel • Single coin drop • 120-240/60/1 electrical service 	
	Subtotal (ea.)	\$1,025.00
	Extended TOTAL (8)	\$8,200.00

TOTAL (HUBER FACILITY LAUNDRY EQUIPMENT) \$25,400.00

CITY COUNTY BUILDING LAUNDRY EQUIPMENT

<u>3</u>	HUEBSCH model YFNE5R Front-Load Washer	
	<ul style="list-style-type: none"> • 3.42 cubic feet capacity • 1,200 RPM Extract • Electronic rear control panel • 120/60/1 electrical service 	
	Subtotal (ea.)	\$1,715.00
	Extended TOTAL (3)	\$5,145.00

<u>3</u>	HUEBSCH model YDEE7RGS17 Front-Load Electric Dryer	
	<ul style="list-style-type: none"> • 7.0 cubic feet capacity • Electronic rear control panel • 120-240/60/1 electrical service 	
	Subtotal (ea.)	\$725.00
	Extended TOTAL (3)	\$2,175.00

TOTAL (CCB LAUNDRY EQUIPMENT) \$7,320.00

PRICING NOTES

- **Applicable taxes are additional**
- ***INCLUDES*** freight, delivery, set/level equipment in place, anchor/grout washers
- Purchaser responsible for final utility connections
- Purchaser responsible for proper concrete foundation for washers
- Pricing valid through 2016. Please budget an additional 5% annually to account for manufacturing price increases
- **PAYMENT TERMS:** 15% with order and balance due at delivery

WARRANTY:

- Herb Fitzgerald Company provides a 90 day service warranty
- MILNOR Washer: *three (3) years non-wearable parts; five (5) years bearings, cylinder, and shell; MILNOR Dryer: three (3) years non-wearable parts*
- HUEBSCH: *three (3) years non-wearable parts*
- AQUAWING: *one (1) year non-wearable parts*

The Herb Fitzgerald Company has been serving the Wisconsin and Upper Michigan laundry industry since 1946. We service all of Wisconsin and Upper Michigan with our factory trained and authorized technicians based out of the Milwaukee, Madison, and Green Bay markets. Our Milwaukee area warehouse carries a fully supply of replacement parts and is staffed full time to assure your prompt service.

When I can be of further assistance, please feel free to call.

Sincerely,

The HERB FITZGERALD COMPANY, Inc.



JOHN FITZGERALD JANZ

john@herbfitzgerald.com
(800) 686-3489, ext. 13 (toll free)
(262) 783-5808, ext. 13 (office)
(262) 613-3880 (cell)



Aquawing Ozone Injection Systems (AWOIS, LLC)
45 Priscilla Lane | Auburn, NH 03032
Phone: 1-888-296-4777 | Fax: 603-644-0498
E-mail: info@AquawingOzone.com
www.AquawingOzone.com



Aquawing Approved for Use in All Facilities by the Department of Health and Human Services, CDC and CMS

“The CMS in collaboration with the CDC has determined that ozone cleaning systems are acceptable methods of processing laundry. This method also requires closely following manufacturer’s instructions. Facilities opting to utilize an ozone laundry cleaning system will need to obtain an initial agreement between the laundry service and facility that stipulates the laundry will be hygienically clean and handled to prevent recontamination from dust and dirt during loading and transport...”

-Department of Health and Human Services (DHHS): SC13-09 01 Clarification of Interpretive Guidance at F Tag 441-Laundry and Infection Control. January 25, 2013.

- **What does this information mean?** Simply put this means ozone laundry systems that leave materials “hygienically clean” are approved for use nationwide.
- **What does “hygienically clean” mean?** The full DHHS document cites the Association for the Advancement of Medical Instrumentation’s definition of hygienically clean: “Free of pathogens in sufficient numbers to cause human illness.”
- **How many ozone systems meet requirements?** Aquawing is the only one. The vast majority of pathogens (germs) within the healthcare industry are fungal, viral, and bacterial. Aquawing is the only system that can provide clinical proof of kill for each category (full list below).
- **What are the requirements to meet the new standards?** End users (owners) of ozone systems must obtain an “initial agreement” from the ozone manufacturer stating the laundry will adhere to the above definition of “hygienically clean.”
- **Are the ozone manufacturers responsible for disinfection?** No. The end user must make an informed decision and select an ozone system that is clinically validated to disinfect laundered materials. Otherwise, anyone in a garage who wanted to build an ozone system could write a letter saying their product disinfects properly.
- **Is the end user still responsible for the safety of their clients?** Yes. Guest/client/patient safety is always the responsibility of the facility. As stated, an initial agreement must be made, but it is the facility who must select the most qualified ozone manufacturer based on research and development data to provide hygienically clean laundry.

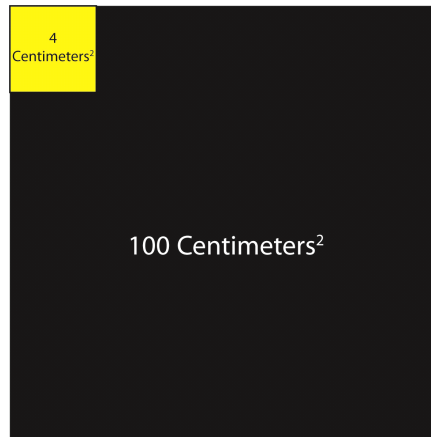
- **Is Aquawing qualified as a proper disinfectant?** Yes. Aquawing has the most extensive collection of microbiological laboratory reports validating disinfection. Over 100 trials of comprehensive testing using Aquawing patented technology has concluded a total kill on the following:

Micro-organism	Initial Amount cfu/ml	After 3mins with Aquawing cfu/ml
Staphylococcus aureus (MRSA)	1.3E+08	0.0E+00
Pseudomonas aeruginosa	3.1E+09	0.0E+00
Candida Albicans	3.1E+08	0.0E+00
Escherichia coli (E.coli)	5.2E+08	0.0E+00
Streptococcus faecalis	5.0E+08	0.0E+00
Aspergillus niger	3.1E+08	0.0E+00
Clostridium difficile (C.diff)	4.2E+08	0.0E+00
Clostridium perfringens	9.2E+08	0.0E+00
Campylobacter jejuni	6.0E+08	0.0E+00
Aeromonas mixed species	8.2E+08	0.0E+00
Actinobacter sps	4.3E+08	0.0E+00
Lactobacilli sps	3.9E+08	0.0E+00

Virus particle Particles/ml	Initial Amount cfu/ml	After 7mins with Aquawing cfu/ml
Lambda phage	3.8E+24	0.0E+00
FCoVA	2.6E+24	0.0E+00
Saccharomyces virus ScV-L-BC	3.1E+23	0.0E+00
Vibrio phage fs1	2.6E+28	0.0E+00

- **What role will health inspectors play?** Health inspectors will ask for a copy of the initial agreement and documentation that the ozone system provides “hygienically clean” laundry. The quote at the top of page one is taken from is a memo to state survey agency directors. The memo is from the director of the survey and certification group notifying health inspectors of the parameters mentioned above.
- **Can anyone other than Aquawing make the same claims? No.** Do not be fooled by:
 1. Ozone manufacturers who have done only a few tests. Aquawing had over 100 trials done with Aquawing patented technology.
 2. Some ozone manufacturers are giving general information about ozone gas as opposed to tests done using their equipment. Disinfection is achieved with a specific ct value. Concentration of ozone (c) * exposure time (t) = ct value. If the concentration or exposure time is incorrect, disinfection will not be achieved.
 3. Aquawing validates disinfection on every washer load with its patented VO₃ technology. This technology senses the concentration (c) of ozone in the contact chamber (washer) for a period of time (t). When the levels reach the Aquawing approved disinfection levels, a light is illuminated on the VO₃ validator. Without this patented technology, there is no way for users to know how much (or how little) ozone is being injected on each wash.

4. Read the fine print. One competitor had a test on a 2cm x 2cm (4 cm²). The standard cm² for Aquawing ozone Laundry Systems is the same as the European Standard: 10cm X 10cm (100cm²).



Test BS EN 1040 1997 / BS EN 1276 1197
(European Suspension Test)

5. Aquawing has had international and American microbiological laboratories perform hundreds of tests and thorough examinations. A package of validated testing will be supplied to customers requesting results.
- **Who is the CMS?** The Centers for Medicare & Medicaid Services, as it relates to the laundry industry, is responsible for quality standards in long-term care facilities. The CMS is a federal agency within the DHHS that administers the Medicare program and works with state governments to administer Medicaid.
 - **Who is the CDC?** Center for disease Control and Prevention. CDC is a US federal agency also under the DHSS that works to protect public health and safety by providing information to enhance health decisions.



RinSave® Water and Labor Savings Calculations

Healthcare and Hospitality

	Standard Washer	Milnor RinSave® Washer	Standard Washer	Milnor RinSave® Washer	Standard Washer	Milnor RinSave® Washer	Standard Washer	Milnor RinSave® Washer	Standard Washer	Milnor RinSave® Washer	Standard Washer	Milnor RinSave® Washer
lbs/load	40	40	60	60	80	80	100	100	140	140	160	160
hp	5	5	5	5	10	10	10	10	15	15	15	15
mins/load	45	40	45	40	45	40	45	40	45	40	45	40
loads/hour	1.33	1.50	1.33	1.50	1.33	1.50	1.33	1.50	1.33	1.50	1.33	1.50
hours/day	8.00	7.11	8.00	7.11	8.00	7.11	8.00	7.11	8.00	7.11	8.00	7.11
loads/day	10.67	10.67	10.67	10.67	10.67	10.67	10.67	10.67	10.67	10.67	10.67	10.67
lbs/day	427	427	640	640	853	853	1,067	1,067	1,493	1,493	1,707	1,707
lbs/year (56 hrs/week)	155,733	155,733	233,600	233,600	311,467	311,467	389,333	389,333	545,067	545,067	622,933	622,933
gals/lb	2.33	2.00	2.33	2.00	2.33	2.00	2.33	2.00	2.33	2.00	2.33	2.00
gals/cycle	93.2	80	139.8	120	186.4	160	233	200	326.2	280	372.8	320
gals/day	994	853	1,491	1,280	1,988	1,707	2,485	2,133	3,479	2,987	3,977	3,413
gals/year	362,859	311,467	544,288	467,200	725,717	622,933	907,147	778,667	1,270,005	1,090,133	1,451,435	1,245,867
\$/1000 gals	\$ 8.50	\$ 8.50	\$ 8.50	\$ 8.50	\$ 8.50	\$ 8.50	\$ 8.50	\$ 8.50	\$ 8.50	\$ 8.50	\$ 8.50	\$ 8.50
Water/Sewer, \$/day	\$ 8.45	\$ 7.25	\$ 12.68	\$ 10.88	\$ 16.90	\$ 14.51	\$ 21.13	\$ 18.13	\$ 29.58	\$ 25.39	\$ 33.80	\$ 29.01
\$/year, Water/Sewer	\$ 3,084	\$ 2,647	\$ 4,626	\$ 3,971	\$ 6,169	\$ 5,295	\$ 7,711	\$ 6,619	\$ 10,795	\$ 9,266	\$ 12,337	\$ 10,590
% HOT	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
Hot gals/day	696	597	1,044	896	1,392	1,195	1,740	1,493	2,436	2,091	2,784	2,389
Hot temp, deg F	140	140	140	140	140	140	140	140	140	140	140	140
Cold temp, deg F	55	55	55	55	55	55	55	55	55	55	55	55
Temp Rise, deg F	85	85	85	85	85	85	85	85	85	85	85	85
BTU's/day	493,319	423,450	739,978	635,174	986,638	846,899	1,233,297	1,058,624	1,726,616	1,482,074	1,973,275	1,693,798
Therms Used/day	4.9	4.2	7.4	6.4	9.9	8.5	12.3	10.6	17.3	14.8	19.7	16.9
\$/Therm Used (see Table below)	\$ 0.85	\$ 0.85	\$ 0.85	\$ 0.85	\$ 0.85	\$ 0.85	\$ 0.85	\$ 0.85	\$ 0.85	\$ 0.85	\$ 0.85	\$ 0.85
Water Heating Fuel, \$/day	\$ 4.19	\$ 3.60	\$ 6.29	\$ 5.40	\$ 8.39	\$ 7.20	\$ 10.48	\$ 9.00	\$ 14.68	\$ 12.60	\$ 16.77	\$ 14.40
\$/year, Fuel	\$ 1,531	\$ 1,314	\$ 2,296	\$ 1,971	\$ 3,061	\$ 2,628	\$ 3,826	\$ 3,284	\$ 5,357	\$ 4,598	\$ 6,122	\$ 5,255
Elec Motor hp	5	5	5	5	10	10	10	10	15	15	15	15
Kwh/hr per hp	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746	0.746
KWh/hr	3.73	3.73	3.73	3.73	7.46	7.46	7.46	7.46	11.19	11.19	11.19	11.19
% Utilization	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
Avg Kwh/hr	2.238	2.238	2.238	2.238	4.476	4.476	4.476	4.476	6.714	6.714	6.714	6.714
KWh/day	17.90	15.91	17.90	15.91	35.81	31.83	35.81	31.83	53.71	47.74	53.71	47.74
\$/KWh	\$ 0.10	\$ 0.10	\$ 0.10	\$ 0.10	\$ 0.10	\$ 0.10	\$ 0.10	\$ 0.10	\$ 0.10	\$ 0.10	\$ 0.10	\$ 0.10
Electricity, \$/day	\$ 1.79	\$ 1.59	\$ 1.79	\$ 1.59	\$ 3.58	\$ 3.18	\$ 3.58	\$ 3.18	\$ 5.37	\$ 4.77	\$ 5.37	\$ 4.77
\$/year, Electricity	\$ 653	\$ 581	\$ 653	\$ 581	\$ 1,307	\$ 1,162	\$ 1,307	\$ 1,162	\$ 1,960	\$ 1,743	\$ 1,960	\$ 1,743
Total UTILITIES, \$/year	\$ 5,268	\$ 4,542	\$ 7,576	\$ 6,523	\$ 10,537	\$ 9,084	\$ 12,844	\$ 11,065	\$ 18,112	\$ 15,607	\$ 20,420	\$ 17,588
Machines/op-hr	4	4	4	4	4	4	4	4	4	4	4	4
Op-Hrs/day/unit	2.00	1.78	2.00	1.78	2.00	1.78	2.00	1.78	2.00	1.78	2.00	1.78
Wage, \$/hr	\$ 12.35	\$ 12.35	\$ 12.35	\$ 12.35	\$ 12.35	\$ 12.35	\$ 12.35	\$ 12.35	\$ 12.35	\$ 12.35	\$ 12.35	\$ 12.35
Labor \$/day	\$ 24.70	\$ 21.96	\$ 24.70	\$ 21.96	\$ 24.70	\$ 21.96	\$ 24.70	\$ 21.96	\$ 24.70	\$ 21.96	\$ 24.70	\$ 21.96
\$/year, Labor	\$ 9,016	\$ 8,014	\$ 9,016	\$ 8,014	\$ 9,016	\$ 8,014	\$ 9,016	\$ 8,014	\$ 9,016	\$ 8,014	\$ 9,016	\$ 8,014
Total Cost, \$/day	\$ 39.13	\$ 34.40	\$ 45.46	\$ 39.83	\$ 53.57	\$ 46.84	\$ 59.89	\$ 52.27	\$ 74.32	\$ 64.71	\$ 80.64	\$ 70.14
TOTAL COST, \$/year	\$ 14,284	\$ 12,556	\$ 16,591	\$ 14,536	\$ 19,552	\$ 17,098	\$ 21,860	\$ 19,079	\$ 27,128	\$ 23,621	\$ 29,435	\$ 25,601
ANNUAL SAVINGS WITH Milnor RinSave®, \$/year		\$ 1,728		\$ 2,055		\$ 2,454		\$ 2,781		\$ 3,507		\$ 3,834

TYPICAL COST OF FUEL TO HEAT WATER				
	Electricity	Propane	Nat. Gas	Fuel Oil
Units	Kwh/hr	Gallons	Therm	Gallons
PRICE \$/Unit	\$ 0.15	\$ 2.35	\$ 0.85	\$ 2.30
BTU/Unit	3413	93,000	100,000	129,000
Th/Unit	0.034	0.930	1.000	1.290
\$/th bought	\$ 4.39	\$ 2.53	\$ 0.85	\$ 1.78
Efficiency	95%	85%	85%	75%
\$/Therm Used	\$ 4.63	\$ 2.97	\$ 1.00	\$ 2.38





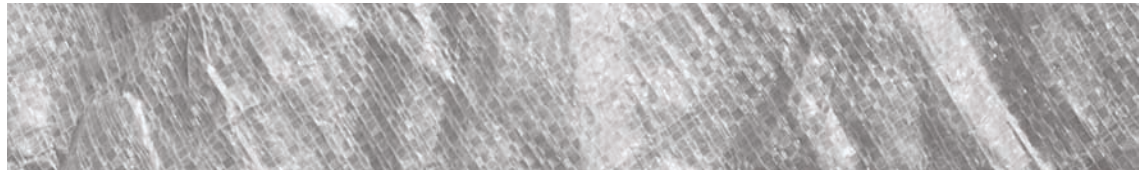
30-190 LB. DRYERS

MORE RELIABILITY • HIGH PERFORMANCE • WIDE RANGE OF MODELS



M758V

M30V-M190



SMART DESIGN

Roller drive for reliability.

Some dryers use the same type of drive and support as 400 lb. dryers. There's no maintenance-prone gear box either. (Feature available on M96, M122, M175, and M190.)



Roller drive gives better cylinder support, contributes to long life.

High Performance Dryers with the features you need.



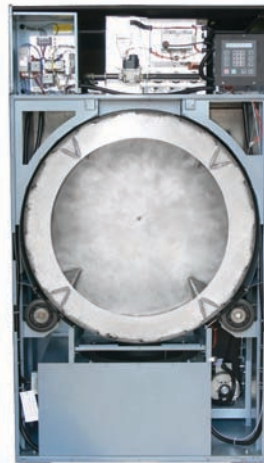
M30V & M115 not pictured

MORE VALUE

Speed boosts productivity.

The M96 can dry approximately 165 lbs an hour, accommodating loads from Milnor washer-extractors.* Diameter is 42 inches—for better lift and drop, more exposure to hot air. The M96 boosts productivity by drying quickly. Heat input is an impressive 350,000 btu/hour, with 2,700 cfm airflow (and a 3HP blower motor) for the highest heat exchange in its field. The M122 has a heat input of 415,000 btu/hour with 2,800 cfm airflow.

*Depending on fabric type and load size.



Servicing is done from the front; saves time and space, reduces risk.

Fits through 36" door.

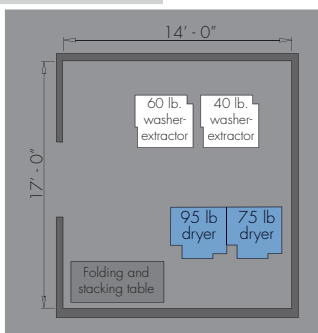
The M30V, M50V, M78* and the M96* can move through a 36" steel door frame. *The top console is removable.

It's front-serviceable!

The entire front panel can be removed from some machines so maintenance can be performed from the front. It's a time-saving convenience for service - and a safety benefit. Lint is removed from the front through a large capacity lint drawer. (Feature available on M96, M122, M175, and M190.)

Saves space.

Surprisingly, these dryers are more compact than other dryers. They install close to the wall because there's little to service from the rear of the machine.



PLUS...

Get these benefits, also.

Phase 7 microprocessor: This innovative control has many user-friendly and safety-oriented features.

Reversing basket: To help prevent tangling, the basket reverses rotation on most models.

Built tough: The cabinet is electrostatically painted inside and out, and all components are painted before assembly for thorough protection.

Fully enclosed cabinet: This design, combined with insulation, improves efficiency by capturing radiant heat and using it to dry. Also improves working conditions.

Other standard features: Included are direct spark ignition (fast and reliable) and 24-volt controls.

THE FEATURES YOU NEED.



NEW CONTROL PROMOTES SIMPLICITY, EFFICIENCY, SAFETY.

Phase 7 Microprocessor

This innovative control has:

Efficient Automatic or Manual Mode

Automatic drying helps prevent over-drying and helps eliminate guesswork.

Smart Lint Monitor

For models with lint drawers, the control automatically prompts the operator to clean the lint. If signals are ignored, the dryer will not operate after a maximum number of cycles.

Ignition Retries

If the dryer doesn't ignite, it will wait and try again—up to two retries.

Anti-wrinkle Cooldown

When drying time has ended, this mode tumbles the goods without heat to reduce wrinkling and significantly reduce the risk of spontaneous combustion.

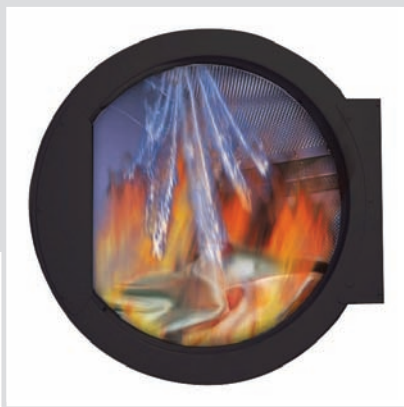
Informative Display

Display allows you to view drum temperature. You can also preview all operations of pre-programmed cycles and see troubleshooting information.

Safety Features

Phase 7 technology provides an optional Fire Suppression System (cold weather FSS also optional) to protect against fire damage caused by spontaneous combustion. The system senses an abnormal rise in temperature and quickly activates a water jet system and turns the basket to extinguish the fire. If for some reason the fire re-ignites, FSS will reactivate to ensure the fire is completely out.

Additional safeties include multi-point high temperature monitoring that will shut off the burner if the temperature exceeds the set point parameters.



30-190 LBS.

M30V

A good match for Milnor 25 lb. washer-extractors. This dryer has a heat input of 100,000 btu/hr (gas) and optional 3 phase reversing basket. The M30 is available in gas, electric, or steam.

M50V

This 50 lb. model has a heat input of 150,000 btu/hour and fits through a 36" door. Phase 7 microprocessor is standard or dual timer. This model is available in gas, electric or steam.

M758V

A popular size, especially when replacing existing 75 lb. dryers. Airflow is 1,000 cfm (gas) with 175,000 btu/hour heat input. Phase 7 microprocessor or dual timer. Available in gas, electric or steam models.

M78

This 75 lb. model fits through a 36" door (its 35" deep with dryer door removed). It has a huge, 44.5" basket diameter (compared to competitor's 37")—for better lift and drop, more exposure to hot air, and more even heat distribution. Available in electric and gas (gas—1,200 cfm airflow, and 204,000 btu/hour heat input).

M82

Fast drying results from 1,700 cfm and 270,000 btu/hour (gas). A good match for smaller Milnor washer-extractors. Available in gas or steam.

M96

This 95 lb. model fits through a 36" door (its 34" deep with dryer door removed). Gas and Phase 7 microprocessor only—2,700 cfm airflow and 350,000 btu/hour.

M115

An excellent replacement dryer (doesn't require compressed air), this model fits through a 48" door and is a perfect match for an 80 lb. washer-extractor.

M122

Is an excellent match for a 80- or 100 lb. capacity washer-extractor. Features roller drive for cylinder support.

M130

This 120 lb. model has a heat input of 375,000 btu/hour (doesn't require compressed air). A 12" exhaust is available on M130DR gas model (ideal for a replacement dryer).

M170

With a 51.2 cu. ft. basket, the M170 is ideal for Milnor 140 and 160 lb. washer-extractors. Fast drying results from 3,700 cfm airflow (gas) and 550,000 btu/hour heat input. Phase 7 microprocessor or dual timer available with gas model, Phase 7 with steam model. Top and transition duct are removable for installation.

M175

This dryer delivers high volume with a small footprint. It only needs 19.7 sq. ft. of space to dry 350 lbs. of poly-cotton sheets per hour. Fast drying results from 3,700 cfm airflow (gas) and 550,000 btu/hour heat input.

M190

Milnor's 190 lb. dryer dries fast through 590,000 btu/hour and 4,200 cfm (gas). Top section and transition duct can be removed for ease in installation. The dryer is only 51.12" deep, yet has a 61.2 cu. ft. basket.

M30V-M190 CONDENSED SPECIFICATIONS

SPECIFICATIONS	UNITS	M30V	M50V	M758V	M78	M82	M96*	M115	M122*	M130 ^Δ	M170 ^Δ	M175* ^Δ	M190*
Max capacity	lbs. (kg)	30 (13.6)	50 (22.7)	75 (34)	75 (34)	80 (36)	95 (43)	115 (52)	120 (54)	120 (54)	170 (77)	170 (77)	190 (86)
Basket diameter	ins. (mm)	32.75 (832)	32.75 (832)	36.25 (920)	44.5 (1130)	37 (940)	41.38 (1051)	42 (1067)	44.12 (1120)	44.63 (1133)	51.5 (1308)	51.12 (1298)	55.62 (1412)
Basket depth	ins. (mm)	25.62 (651)	37.5 (953)	36 (914)	24.88 (632)	36 (914)	28.87 (733)	41.25 (1047)	40.56 (1030)	42.12 (1070)	42.5 (1079)	42.75 (1085)	43.5 (1104)
Basket volume	cu. ft. (L)	12.5 (354)	18.3 (518)	21.5 (608)	22.4 (634)	22.4 (634)	22.5 (637)	33.10 (937)	35.9 (1016)	38.1 (1079)	51.2 (1450)	50.76 (1437)	61.2 (1732)
Door opening	ins. (mm)	21.5 (546)	21.5 (546)	31.38 (797)	31.38 (797)	31.38 (797)	31.38 (797)	31.38 (797)	31.38 (797)	31.38 (797)	31.38 (797)	31.38 (797)	31.38 (797)
Basket/Blower motor (Non-Reversing)	HP (kW)	.5 (.37)	.75 (.56)	1 (.75)	1 (.75)	– –	– –	– –	– –	– –	– –	– –	– –
Reversing basket motor	HP (kW)	.5 (.37)	.5 (.37)	.5 (.37)	.5 (.37)	.5 (.37)	.5 (.37)	.75 (.55)	1 (.75)	.75 (.55)	1 (.75)	3 (2.2)	3 (2.2)
Reversing blower motor	HP (kW)	.5 (.37)	.5 (.37)	1 (.75)	1 (.75)	3 (2.2)	3 (2.2)	3 (2.2)	3 (2.2)	3 (2.2)	7.5 (5.6)	– –	– –
Overall width	ins. (mm)	34.25 (870)	34.25 (870)	38.25 (972)	46.18 (1173)	38.25 (971)	46.12 (1172)	46.13 (1172)	48.62 (1235)	48.62 (1235)	55.87 (1419)	55.87 (1419)	60 (1524)
Overall depth	ins. (mm)	38 (965)	49.75 (1264)	48 (1219)	35 (889)	51.5 [†] (1308) [†]	35.25 (869)	63.56 (1614)	52.50 (1334)	69.25 (1759)	63.5 ⁺ (1613) ⁺	51 ⁺ (1295) ⁺	55.12 ^{††} (1309) ^{††}
Overall height	ins. (mm)	72 (1829)	72 (1829)	75.12 (1908)	84.31 (2142)	75.12 (1908)	82.37 (2092)	84 (2134)	87.5 (2223)	86.87 (2207)	100 (2540)	100 (2540)	106 (2692)
Approx net weight***	lbs. (kg)	534 (242)	651 (295)	721 (327.04)	888 (403)	833 (377)	1,087 (493)	1,260 (571)	1,370 (621)	1,260 (571)	2,103 (954)	1,848 (838)	2,100 (952)
FSS water connection	ins. (GHT)	.75	.75	.75	.75	.75	.75	.75	.75	.75	.75	.75	.75

GAS MODELS

Airflow	cfm (cmm)	460 (13)	750 (21.2)	1,000 (28.3)	1,200 (33.9)	1,700 (48.14)	2,700 (76.5)	2,100 (59.5)	2,800 (79.2)	2,150 (60.9)	3,700 (104.7)	3,700 (104.7)	4,200 (119)
Heat input	btu/hr (kcal/hr)	100,000 (25,200)	150,000 (37,800)	175,000 (44,100)	204,000 (51,407)	270,000 (68,038)	350,000 (88,200)	343,000 (86,435)	415,000 (104,578)	375,000 (94,498)	550,000 (138,598)	550,000 (138,598)	590,000 (148,678)
Gas inlet	NPT	0.5	0.5	0.75	0.75	1	1	1	1.25	1	1.5	1.5	1.5
Exhaust diameter	ins. (mm)	8 (203)	8 (203)	8 (203)	10 (254)	14 (356)	16 (406)	14 (356)	16 (406)	14++ (356)	18 (457.2)	18 (457.2)	20 (508)

STEAM MODELS

Boiler	Bhp	3	4.1	7.2	–	11	–	11	13	13	19	14.5	14.5
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ELECTRIC MODELS

Oven	kW	20, 24	20, 24, 30	30	24, 36	–	–	60, 72	72	72, 75.6	126	–	–
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All specifications above are for gas dryers at 60Hz unless noted otherwise. Consult factory for steam and electric dryer specifications.

* Equipped with roller drive; also 100% front-serviceable. *** Non-reversing model.

^Δ Designates DR (D-Rated/Direct Replacement) available on gas models.

+ Includes 5" (127mm) transition duct which can be removed for easy installation. † 3.5" (89mm) duct. †† 4" (101mm) duct.

++ Includes 12" exhaust diameter on M130DR Gas model.

For detailed specifications, dimensional drawings, compressed air requirements (if applicable), etc., please contact us.

All specifications subject to change without notice.

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25 – 60 lb. WASHER-EXTRACTORS

QUALITY, VALUE, DURABILITY ■ FOUR CAPACITIES ■ EASY-TO-USE CONTROLS



60 lb. capacity model MWR27J5

True commercial cabinet-style washer-extractors at the RIGHT PRICE.



MWR16E5 with E-P One Touch® control

Milnor's value-priced MWR-Series washer-extractors range in capacity from 25-60 lbs. (11-27 kg). Available in three controls, the MWR-Series offers savings and flexibility—without compromising the wash quality you expect from a Milnor.



MWR18X4 with E-P Express® control

Save Labor



The MWR-Series offers multiple ways to save on labor costs and improve employee efficiency. The **three controls** (E-P One Touch®, E-P Express®, E-P Plus®) assist the operator in choosing the correct formula for goods and soil type, which reduces rewash. The **large cylinder volume** generates greater productivity through enhanced mechanical action, thorough rinsing and improved extraction. The result is more linen washed per day, or fewer hours required to process the linen. The microprocessors and software are reliable and fast, which allows for quicker processing of programmed formulas. This faster process time translates into cycles completing sooner—and more loads per operator.

Save on Linen Replacement Costs



The second highest expense in a laundry is the cost of the linen. Milnor's MWR-Series can help you extend your linen life with its **safe chemical injection** system. The manual soap chute is located on the top of the washer, giving you easy access when injecting chemistry. For customers using automatic supply, the chemistry is diluted through the soap chute, preventing any direct contact with the stainless steel or linen.

Save Energy



Milnor's MWR-Series is efficient, reducing your utility bills. The **Frequency Drive system** features a single-motor inverter drive that reaches maximum extraction speed gradually and efficiently, reducing peak electricity amperage draw seen in multi-speed motors. The **proper cylinder design** features an increased perforated area, tall ribs, and better extraction. These elements translate into excellent wash quality, better rinsing, and less drying time—saving on dryer fuel.

Save Water



Milnor machinery is not only efficient, it's eco-friendly. The MWR-Series helps you to reduce fresh water consumption with its **perforated cylinder and ribs** that promote rapid drainage of gray water and reduce excessive rinsing. The simple **hot and cold water inlets** fill the washer quickly and precisely. The MWR-Series conserves water by maintaining accurate levels. A third water inlet is used to thoroughly dilute chemistry to protect from direct contact that may damage linens.

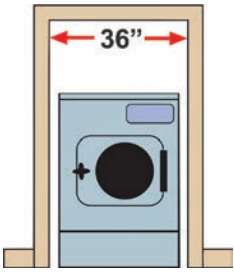
Save Money (Total Cost of Ownership)



There are many features integrated into the MWR-Series that reduce your total cost of ownership—saving you money for years after your initial investment. Milnor has engineered the MWR-Series frame to **prevent stress concentration** in any one area, thereby insuring **structural integrity** during years of continued use. Before any machine is sold, Milnor **thoroughly tests every design for over 1,000 continuous hours** in high extract, in an out-of-balance state. Milnor's extensive dealer network has been trained and certified to install and service your machine. Finally, **low initial capital** ownership, coupled with proven Milnor engineering, makes the MWR-Series a wise investment.

Why choose Milnor?

Flexibility in control options, Durability in Design.

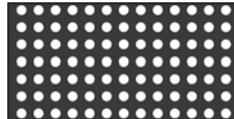
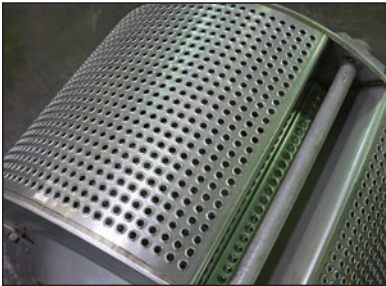


1 The MWR-Series fit through a standard door. No need to remove the door jambs during installation!

2 Frames are designed and constructed from heavy gauge steel to disperse stress evenly. This gives you the long-lasting durability you expect from Milnor.

3 Warranties attest to Milnor endurance and confidence. Consult your authorized Milnor dealer or factory for specifics on our 5/3 Warranty Plan.

4 Milnor's cylinders have large perforations so the gray water can drain away faster. They promote high wash quality (intense interchange of chemistry with goods), thorough rinsing, and enhanced extraction (trapped water can escape the goods, too).



MILNOR



TYPICAL COMPETITOR

5 Milnor's cylinders have efficient inverter drives that produce three speeds for optimum washing.* Three speed washing (along with higher ribs) allows for optimum mechanical action factor (M.A.F.). The distribution speed prevents vibration during extract by evenly distributing the goods to the periphery of the basket. This insures optimum moisture extraction and reduces dry times. The final extract speed is keyed towards today's fabrics. Coupled with a big cylinder (which means a thinner layer of goods for water to pass through) and large perforations, you have better extraction in a Milnor.



*E-P Plus® only.



E-P OneTouch® control

This basic control features four pre-programmed wash formulas (based on soil type) that are clearly identified by graphics for easy selection. The simple push buttons activate the corresponding formula. Operators can see when the final step has been initiated when the indicator light is illuminated. This notification increases productivity, with less downtime between cycles.

E-P Express® control

This median control is equipped with 30 pre-programmed formulas that provide flexibility in use. The bright display allows the operator to choose from real words, not codes. The control features English/Spanish standard (other languages optional) and diagnostic/error messages help shorten training time of new employees and allow for fewer operating errors.



E-P Plus® control

This comprehensive control is equipped with 30 pre-programmed formulas (including 10 options for eight different industries) and allows the operator advanced flexibility. The E-P Plus operator may manually create or alter formulas, which are guided by the control itself to insure proper and accurate washing. The control also features universal temperature control, programmable cooldown, programmable bath soak and overnight soak. The two-line display notifies the operator of key benchmarks (wash step, time remaining, etc.), which increases productivity and reduces downtime.

THREE CONTROLS

MWR-Series: Affordable Price. Durable Design.

Features at a glance:

- Increased capacity for greater production
- Simple, single motor design offers smooth operation
- Three control options based on your needs
- Three wash speeds deliver advantages over two-speed models (E and X models only)
- Six speeds offer increased advantages in washing (J models)
- Proper cylinder and rib design for enhanced mechanical action factor, wash/rinse quality
- Soap chute and liquid soap connectors standard
- Durable, galvanized steel frame (stress is spread evenly)
- Bearings aligned in rigid housing
- Double water seals protect bearings
- 5/3 Warranty Plan
- All models fit through standard 3'-0" door

MWR-Series Specifications

	MWRI2E5 MWRI2X5 MWRI2J5	MWRI6E5 MWRI6X5 MWRI6J5	MWRI8E4 MWRI8X4	MWRI8J6	MWR27E5 MWR27X5 MWR27J5
Maximum Capacity – lbs. (kg)*	25 (11)	35 (16)	45 (20)	45 (20)	60 (27)
Cylinder diameter – ins. (mm)	23 (584)	23 (584)	28 (711)	28 (711)	30 (762)
Cylinder depth – ins. (mm)	14 (356)	18 (457)	18 (457)	18 (457)	22 (558)
Gross cylinder vol – cu. Ft. (L)	3.37 (95)	4.3 (121)	6.4 (180)	6.4 (180)	9.0 (255)
Door Opening – ins. (mm)	12 (305)	12 (305)	15.5 (394)	15.5 (394)	15.5 (394)
Motor – HP	1	1.5	3	3	3
Wash Speed – RPM** (E and X control)	43	43	39	n/a	38
Wash Speed – RPM** (J control)	42-47	42-47	n/a	35-39	38-43
Distribution Speed – RPM**	92	92	72	73	68
Extract – RPM** (E and X control)	421	525	475	n/a	485
Extract Speeds – RPM** (J control)	372-421	372-421	n/a	321-617	252-485
Maximum Extract G Forces	90	80	90	150	100
Drain Valve – ins. (mm)	2 (51)	2 (51)	3 (76)	3 (76)	3 (76)
Inlet Connection – ins. (mm)	0.75 (19)	0.75 (19)	0.75 (19)	0.75 (19)	0.75 (19)
Overall width – ins. (mm)***	26 (660)	29 (736)	34.44 (875)	34.44 (875)	34.44 (875)
Overall depth – ins. (mm)***	34.94 (888)	42 (1067)	47.63 (1209)	47.63 (1209)	53.32 (1355)
Overall height – ins. (mm)***	42.38 (1077)	42.38 (1077)	52.63 (1337)	52.63 (1337)	55 (1398)
Approximate gross weight – lbs. (kg)***	529 (240)	584 (265)	816 (370)	984 (446)	1102 (500)

*Depending on density and soil content of goods **Approximate

***With standard accessories. Specifications and appearance subject to change without notice. Contact factory for acoustics data.



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RIGID MOUNT WASHER-EXTRACTORS WITH MILTOUCH™

TOUCHSCREEN CONTROL • UP TO 300 G'S • RINSAVE® WATER SAVER



30022 V8Z

TOUCHSCREEN CONTROL FOR EASE AND FLEXIBILITY IN WASHING

MILTOUCH™ TOUCHSCREEN CONTROL

Utilizing resistive touch screen technology and full VGA resolution, the MilTouch™ control has a clear and informative display which shows current machine status info including total formula time and time elapsed. With complete programming flexibility, MilTouch™ touchscreen control formulas can be developed on a PC, saved to USB external memory and uploaded with a screen touch. With intuitive fault diagnosis and relevant troubleshooting suggestions, the MilTouch™ control streamlines employee training and eliminates operator guesswork.



WHAT CAN YOU SEE WITH THE MILTOUCH™ CONTROL? A LOT OF INFORMATION ON ONE EASY-TO-READ SCREEN!



To download the MilTouch PC programmer, visit milnor.com/miltouchprogrammer

- A. Wash Program Number and Name
- B. Step Number indicates when the machine will finish
- C. Step Time Remaining and Total Step Time
- D. The Step Name is programmed by the user
- E. Programmed Bath Temperature and Water Level
- F. The date and time are recorded in the productivity log files
- G. Wash Cycle Start time
- H. Bath temperature in a graphic format
- I. Manual control allows user to change water levels
- J. Pause button allows the user to halt the timer or properly end the formula
- K. Bath level indicator
- L. Progress bar shows current and total steps
- M. Formula Time Remaining and Total Formula Time
- N. Step Type displays which of the pre-defined steps is running
- O. Steam Valve and Cooldown Valve indicators
- P. Drain indicator
- Q. Water Valve indicators
- R. Chemical Valve indicators

STANDARD FEATURES IMPROVE WASH QUALITY AND PROLONG LINEN LIFE



RINSAVE® WATER SAVER

Milnor's RinSave® water saver feature is standard on all V-Series washers. The patented software allows for the basket to reach a precise G-force that "slings" the wash liquor (including water, chemistry, and soil) out of the goods after a wash step. This feature will save up to 2 rinses per load and fill/rinse time. Laundries with the RinSave feature will get more loads per hour to save you money!

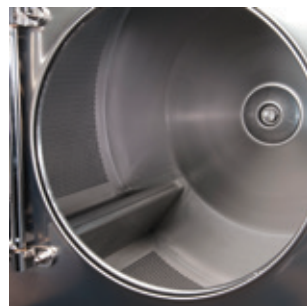


Scan to see cost savings



SUPERIOR CYLINDER DESIGN

Milnor's tall rib construction and precise cylinder speeds combine to provide excellent MAF – Mechanical Action Factor – ensuring goods get clean the first time, reducing time-consuming and costly rewashes.



36026 cylinder shown



SAFE CHEMICAL INJECTION

Chemicals are injected in the rear of the machine (unlike certain brands where chemicals are injected near the front of the machine at eyelevel). Chemicals are diluted and flushed into the sump of the washer-extractor so that raw chemical does not come in direct contact with the linen or the stainless steel. The metal lip prevents corrosion, which prolongs the life of your Milnor washer-extractor.



30022 V8Z chemical inlet shown



CONTINUOUSLY WELDED FRAME

Milnor frames are designed to prevent concentration of stress in one spot and all structural components are tied together for optimum stress dispersion. This proven structural integrity means your machines will last longer.



30022 V8Z frame shown



EXACTTRACT® EXTRACTION OPTIMIZER

ExactXtract® extraction optimizer monitors physical vibration of the machine allowing the machine to safely reach final extraction speeds up to 300Gs. This utility saving feature is standard on the following models: **36021 V7Z, 36026 V7Z, 42026 V6Z, and 42030 V6Z.**



EFFICIENT MOTOR

A NEMA Premium® efficient inverter-driven motor reaches maximum extraction speed more gradually and efficiently, reducing peak electricity amperage draw compared to multi-speed motor machines.



NEMA Premium® is a registered trademark of Baldor Electric Company.

Milnor's V-Series washer-extractors with the MilTouch™ control are available in five capacities, ranging from 40 -160 lbs. (18-72 kg). The continuously welded frame, intelligent control, and standard RinSave® water saver, make these washer-extractors ideal for any commercial laundry.



SPECIFICATIONS

	30015 V8Z	30022 V8Z	36021 V5Z	36021 V7Z	36026 V5Z	36026 V7Z	42026 V6Z	42030 V6Z
Capacity*—lbs. (kg)	40 (18)	60 (27)	80 (36)	80 (36)	100 (45)	100 (45)	140 (64)	160 (72)
Cylinder diameter—ins. (mm)	30 (762)	30 (762)	36 (914)	36 (914)	36 (914)	36 (914)	42 (1066)	42 (1066)
Cylinder depth—ins. (mm)	15 (381)	22 (559)	21 (533)	21 (533)	26 (660)	26 (660)	26 (660)	30 (762)
Cylinder volume—cu. Ft. (L)	6.14 (174)	9 (225)	12.37 (350)	12.37 (350)	15.3 (433)	15.3 (433)	20.8 (590)	24 (679)
Door opening—ins. (mm)	15.5 (394)	15.5 (394)	18 (457)	18 (457)	18 (457)	18 (457)	20 (508)	20 (508)
Overall width—ins. (mm)	34.5 (876)	34.5 (876)	47.88 (1216)	51.81 (1316)	47.88 (1216)	52.62 (1337)	51.44 (1307)	51.44 (1307)
Overall depth—ins. (mm)	48.62 (1234)	55.56 (1412)	53 (1346)	67.19 (1706)	58 (1473)	72.19 (1833)	76.12 (1933)	79.5 (2020)
Overall height—ins. (mm)	57.32 (1455)	57.69 (1466)	67 (1702)	69 (1753)	67 (1702)	69 (1753)	69.62 (1768)	69.62 (1768)
Motor—HP (kW)	5 (3.72)	5 (3.72)	10 (7.45)	5 (3.72)	5 (3.72)	10 (7.45)	10 (7.45)	15 (11.19)
Wash Speeds—RPM	30-46	30-46	25-45	25-45	25-45	25-45	25-41	25-41
Extract Speeds—RPM	200-840	200-840	200-545	200-770	200-545	200-770	200-710	200-710
Distribution Speed—RPM	65	65	65	65	65	65	60	60
Max Extract Speed—RPM	840	840	545	770	545	770	710	710
Extraction G-Force	300	300	150	300	150	300	300	300
Inlet connection—ins. (mm)	0.75 (19)	0.75 (19)	0.75 (19)	0.75 (19)	0.75 (19)	0.75 (19)	1.25 (31)	1.25 (31)
Drain valve—ins. (mm)	3 (76)	3 (76)	3 (76)	3 (76)	3 (76)	3 (76)	3 (76)	3 (76)
Approx. gross weight—lbs. (kg)	1,090 (494)	1,106 (502)	1,455 (660)	2,066 (937)	1,500 (680)	2,073 (940)	2,054 (932)	2,230 (1012)

Specifications and appearance subject to change without notification. Contact the factory for acoustics data. *Depending on density and soil content of goods.

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SUSPENDED WASHER-EXTRACTORS

CONTROLS VIBRATION • HIGH G-FORCE EXTRACTION • FOUR CAPACITIES



Model 42032 X7R

UNSURPASSED WASH QUALITY

Milnor's X-Series suspended washer-extractors range in capacity from 60-170 lbs. (27-77 kg). Available in the intuitive MilTouch-EX™ control, Milnor's X-Series offers you savings and programming flexibility—without compromising the wash quality you expect from a Milnor. Read more to see how this suspended washer-extractor product line is ideal for your commercial or industrial laundry application.



Save Labor



Milnor's **MilTouch-EX™ control** allows the operator advanced flexibility by manually creating or altering formulas, which are guided by the controls and promote accurate, proper washing. The display notifies the operator of key benchmarks (wash step, time remaining, etc.), which increases productivity and reduces downtime. Milnor's **tall rib construction** and **precise cylinder speeds** provide excellent MAF (Mechanical Action Factor), which expedites the interchange of wash chemistry and water, for quicker washing and rinsing. The X-Series cleans the goods properly the first time, so your laundry and staff can continue to be efficient.

Save on Linen Replacement Costs



The second highest expense in a laundry is the cost of the linen (or to replace it). Milnor's X-Series can help you extend your linen life with its safe **chemical injection system**. Chemicals are injected in the rear of the machine (unlike certain brands where chemicals are injected near the front of the machine at eye-level), then diluted and flushed into the sump. This prevents raw chemistry from coming into direct contact with the linen or the stainless steel. In addition to the chemical injection system, the X-Series' **spacious wash cylinders** provide more room for lift and drop action and for goods to open up and absorb wash and rinse water - ensuring goods get clean the first time, reducing rewashes and linen fatigue.

Save Energy



Milnor's X-Series is highly efficient, reducing your utility costs. The frequency inverter drive allows the motor to reach maximum extraction speed more efficiently, thereby reducing peak electricity amperage draw compared to multi-speed motor machines. Bigger **cylinder perforations** provide (1) better wash quality by promoting excellent interchange of the goods with water and chemistry, (2) better rinsing by allowing rinse water to freely interact with the goods, and (3) better extraction by allowing water to escape from goods easily and quickly. The cylinder design minimizes wasteful rewashes and reduces drying time, all resulting in lower energy costs.

Save Water



Milnor's efficient X-Series is also eco-friendly. Milnor's **RinSave® water saver** feature is standard on all X-Series washers. Milnor's engineers developed this unique software to drive the basket toward a precise G-force that "slings" the wash liquor (including water, chemistry, and soil) out of the goods after a wash step. This feature will save up to 2 rinses per load and fill/rinse time. **Simple hot and cold water inlets** are used to quickly fill the washer without fill level overshoot (machines with multiple valves can overflow a machine). A third water inlet is used to thoroughly dilute chemicals so that raw chemicals do not directly contact and damage linens. Accurate water levels promote proper washing and prevent wasting water.

Save Money (Total Cost of Ownership)



Milnor's dynamically tuned suspension features a cutting-edge design that employs a unique, two-point suspension system. The center of mass is located where an imbalance would occur. With **SmoothCoil™ Suspension System**, constructed of highly-engineered fabric and rubber layered coils that provide low natural frequencies, vibration is constantly isolated (delivering smooth operation and performance). Dynamic forces are evenly applied resulting in: minimum vibration, smooth extraction, less wear and tear, and longer machine life. **Tapered roller bearings** have a large contact area - spreading force and contributing to long life. Front and rear bearings are fixed in the same housing, preventing damaging misalignment. Like all Milnor machinery, X-Series machines typically last longer because of their legendary ruggedness, thoughtful design, and **dependable quality**.

THOUGHTFUL, RELIABLE DESIGN

RINSAVE® WATER SAVER



This exclusive software drives the basket toward a precise G-force that "slings" the wash liquor (including water, chemistry, and soil) out of the goods after a wash step. This feature will save your laundry time, energy, and labor.

SMOOTHCOIL™ SUSPENSION SYSTEM



Rubber springs are used to isolate vibration and deliver smooth operation and performance. Plus, they resist corrosion and are virtually maintenance free!

DYNAMICALLY TUNED SUSPENSION



Dynamic forces are evenly applied for minimum vibration, which provides smooth extraction, less wear and tear, and longer machine life.

SIMPLE WATER INLETS



These simple hot and cold water inlets allow your wash formula to achieve accurate water levels for every cycle. A separate water valve allows for the safe transport of chemistry into the wash liquor, which preserves linen life!

SUPERIOR PERFORATION PATTERN



MILNOR



TYPICAL COMPETITOR



The basket's greater open area allows for suspended solids to be rinsed away from the goods quickly, saving valuable time and fresh water!

SOLID, INDUSTRIAL FRAME



Milnor's suspended washer-extractor frames feature heavy-gauge steel columns for maximum durability.

TOUCHSCREEN CONTROL



The MilTouch-EX™ control is an enhanced version of the MilTouch™ control, which utilizes resistive touch screen technology and full VGA resolution. The clear and informative display shows current machine status info

including total, formula time, and time elapsed. With complete programming flexibility, MilTouch-EX™ touchscreen control formulas can be developed on a PC, saved to USB external memory and uploaded with a screen touch. The control has intuitive fault diagnosis and relevant troubleshooting suggestions, which streamlines employee training and eliminates operator guesswork. The 15 chemical signals and MilTouch-EX™ control allow the user complete access to the machine's function at every level and wash/rinse step (within safety limits). The MilTouch-EX™ control can be interfaced with specialized options such as metered water and integrated reuse tanks.



WHY CHOOSE X-SERIES?

- Suspended frame allows for above-ground level installation*
- Tapered roller bearings are aligned in a rigid housing (ensures proper basket alignment)
- Models have been tested for over 1,000 hours in an out-of-balance state
- Superior wash cylinder design yields greater mechanical action (reduces rewashes for prolonged linen life)
- Touchscreen control
- Four capacities to suit your laundry's needs
- 5/3 Warranty Plan

SPECIFICATIONS	30022 X8R	36026 X8R	42026 X7R	42032 X7R
Max capacity – lbs. (kg)*	60 (27)	100 (45)	140 (63)	170 (77)
Cylinder diameter – ins. (mm)	30 (762)	36 (914)	42 (1067)	42 (1067)
Cylinder depth – ins. (mm)	22 (559)	26 (660)	26 (660)	32 (813)
Door opening – ins. (mm)	15.69 (398)	20.38 (518)	26 (660)	26 (660)
Gross cylinder volume – cu. Ft (L)	9 (255)	15.3 (434)	20.8 (590)	25.7 (727)
Motor-HP (kW)	5 (3.7)	10 (7.4)	15 (11.2)	15 (11.2)
Wash Speeds – RPM**	38 - 44	39 - 45	36 - 40	36 - 40
Distribution – RPM**	68	65	60	60
Extract Speeds – RPM**	390 - 840	375 - 766	400 - 710	400 - 710
Max. Final Extract – RPM**	840	766	710	710
Max final G Forces	300	300	300	300
Drain valve – ins. (mm)	3 (76)	3 (76)	3 (76)	3 (76)
Inlet connection – ins. (mm)	0.75 (19)	0.75 (19)	1.25 (31)	1.25 (31)
Width – ins. (mm)	42.75 (1085)	52 (1322)	62.9 (1598)	62.9 (1598)
Depth – ins. (mm)	60.75 (1544)	68 (1727)	74 (1880)	80 (2032)
Height – ins (mm)	66.5 (1689)	76.37 (1940)	88.75 (2254)	88.75 (2254)
Approx. gross weight – lbs. (kg)	2,362 (1071)	3,904 (1771)	5,599 (2540)	5,770 (2617)

*Depending on density and soil contents of goods. **Standard accessories.
 Specifications and appearance subject to change without notice. Consult factory for static load and dynamic forces.

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VO₃

Validated
Ozone



Aquawing Ozone Injection Systems (AWOIS) has redefined ozone laundry technology. Utilizing patented technology, AWOIS provides unmatched savings and other benefits to our client base in a user friendly and reliable package.

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VO₃
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Ozone



What Validated Ozone is:

The engineers at Aquawing have created the VO₃, a new device which **validates ozone in the wash wheel**. The VO₃ offered by Aquawing for all Aqua-Fusion products validates that mandatory levels of ozone have been reached and maintained within the wash wheel. When reducing hot water usage, users need verification that a proper ozone concentration has been achieved and maintained to provide disinfection and superior wash results.



How it Works:

An advanced microprocessor is mounted in the new system controller on each Aqua-Fusion ozone tower. This processor monitors the sensors mounted at each washer and when ideal ozone levels have been achieved for a set time the VO₃ light will illuminate assuring users that the wash result will be disinfected with outstanding wash quality. The system is easily reset with the push of a button when the washer is reloaded and restarted. The new VO₃ module can be mounted on the washer or in a central location within the wash room.

VO₃
Validated
Ozone



The New Aqua-Fusion System Controller:

- New Digital Display: LED's will display board functions including all inputs and outputs, and will illuminate on the board as activated.
- Additional sensor board power outputs provide cleaner DC power.
- Dual air prep outputs: Two air prep units can be run on a single tower. They can run together or as separate units to deliver more amounts of oxygen to the ozone generators, if required.
- The board uses 220v volt washer signal inputs.
- Additional cold contact washer inputs: for use with level switch and relay signals. Provides for cleaner and quicker install multiple interfacing.
- Additional ambient air monitors: should users want to have more than one ambient air quality monitor, the new system controller has the ability to handle multiple monitors.
- Control box cover lights notify users of the status of the Aqua-Fusion patent pending variable ozone.
- The service light is designed to remind users of recommended service appointments.
- Audible signal available: if ambient monitors are measuring levels approaching maximum OSHA recommendations, an audible sound is available to notify laundry personnel.



Aqua-Fusion: Couldn't be Greener, Couldn't be Cleaner