



Product Knowledge Lunch & Learn

Energy Efficiency Program for Business



Kevin Salatrik

Program Lead

Work Smart.
Be Safe.



Safety Information

- In the event it becomes necessary to evacuate Little Caesar's Arena for any reason, please follow these guidelines to walk calmly out and away from the venue. Stairs are located next to the elevators. Take stairs down to the Google Lobby, Floor 1, and exit at street level.
- Elevators and Escalators will not be in use during an emergency evacuation.
- ADA Guests and anyone who may require additional assistance, please notify any of the Little Caesar's Arena personnel.

Agenda

- Compressed Air | Jeff Alstead – Metropolitan Air Compressor Company, Inc.
- Barrel Wraps | Mike Rose – True North Energy Solutions, LLC



Compressed Air



DTE Energy Energy Program for Business

Product Knowledge Lunch & Learn
Compressed Air

NOVEMBER 9TH 2022

About Me Jeff Alstead



- Education – Michigan State University
- Work Experience
 - 17 Years in Compressed Air Industry
 - Compressed Air System Engineer & Auditor (SMC)
 - Systems Specialist (Metropolitan Air Compressor)
- My Goal – Advise and Offer Honest Opinion
- Provide Solutions to Customer's Problems, Add Value

Keeping Michigan's Manufacturers Running Efficiently!



Agenda



Why Compressed Air

Why is it used?
Alternatives?
All mfg. options



DTE Rebates

Process electric
CA23-CA50



Cost to Operate Compressor System

How much is your system
costing you?
Typically, largest motor
1-shift vs. 3-shifts
Goals?



Q & A Summary



Savings Opportunities

Leaks, controls, excessive
pressure, etc.



CAUTION
COMPRESSED
AIR

Why Compressed Air?

- Popular energy source, easy to store, clean
- Safer and cheaper (vs. electricity vs. battery vs. steam)
- Versatile (many uses)
- Control, installation, accessibility
- ~All mfg. facilities use compressed air, although most do it poorly

Cost to Operate Compressor System

Do you know how much your air compressor system costs to operate per year?

	2,000 hours/year	4,000 hours/year	8,000 hours/year
25-HP	\$4,712	\$9,424	\$18,847
50-HP	\$9,425	\$18,847	\$37,693
75-HP	\$14,135	\$28,270	\$56,539
100-HP	\$18,847	\$37,693	\$75,386
150-HP	\$28,270	\$56,539	\$113,078
200-HP	\$37,693	\$75,386	\$150,771
300-HP	\$56,539	\$113,078	\$221,156

*Based upon \$0.12 per kWh



Calculate your compressed air baseline!

Savings Opportunities

1. Compressed Air Leaks
2. Inefficient Compressor Control
3. Excessive Pressure
4. Piping and Infrastructure Inefficiencies
5. Inappropriate Uses
6. Drying and Filtration
7. Inefficient Drains
8. Many, many more





Fewer Leaks, More Savings

Increase system capacity, reduce energy use, lower cost

Savings Opportunities

#1 Compressed Air Leaks

- ✓ #1 Opportunity for Energy Savings!
- ✓ Typical Plant has a leak rate of 20%
- ✓ DTE Rebates: CA-25, CA-41

Size	Cost per Year
● 1/16"	\$523
● 1/8"	\$2,095
● 1/4"	\$8,382

Costs calculated using electricity rate of \$0.05 per kWh, assuming constant operation, and an efficient compressor.

What can be done?

1. Leak detection
2. Develop a preventative maintenance compressed air leak program
3. Make departments accountable for their air systems



Which Control Type is Most Efficient?

Variable Speed Drive
Variable Displacement
Inlet Valve Modulation
Load/No-Load

... It depends!

Savings Opportunities

#2 Inefficient Compressor Controls

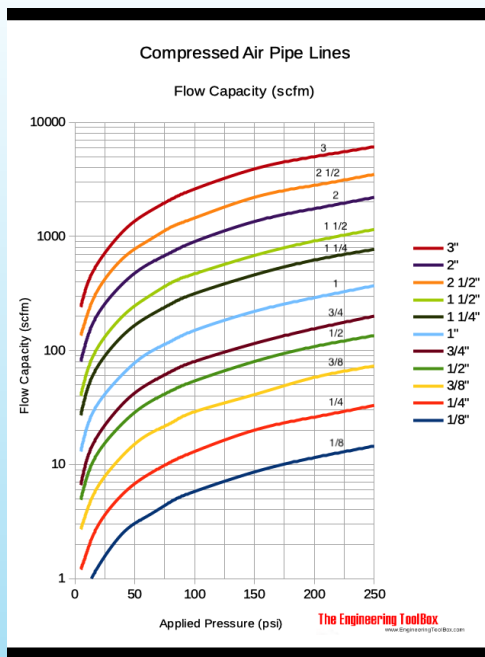
- Misapplied controls
- Partially loaded compressors
- Compressor too large or too small
- Not enough storage
- Multiple compressors not communicating with each other
- Multiple partially loaded compressors
- Wrong environment
- DTE Rebates: CA-26, CA-43, CA-34, CA-44, CA-33, CA-45 CA-46, CA-47, CA-48, Custom

Savings Opportunities

#3 Excessive Pressure

- Very common
- What pressure do you need to operate at to maintain production?
- For every 2-PSIG reduction, 1% of power can be saved
What does this mean?
Example: 10-PSIG reduction on 100-hp system can reduce power required by 5-hp
\$3,800.00 annually
- TIP -> reduce plant operating pressure by 1-PSIG at a time until optimal pressure is realized
- Install a pressure & flow controller?
Need storage!
- DTE Rebates: CA-24, Custom





Savings Opportunities

#4 Piping and Infrastructure Efficiencies

- ✓ Inefficient or undersized piping causes pressure drop
- ✓ Can lead to compressor control issues
- ✓ Costs money!
- ✓ May make you over size air compressor!
- ✓ Have experienced and educated professional provide an evaluation
- ✓ Alternatives to black pipe?
Aluminum, copper, stainless steel



Air Discharge Capacity in Cubic Feet per Minute

Orifice Size (Inches)	Working Pressure PSI				
	50	100	150	200	250
1/32	0.6	1.1	1.5	2.0	2.5
3/64	1.3	2.4	3.4	4.5	5.5
1/16	2.4	4.2	6.1	8.1	9.9
5/64	3.7	6.6	9.6	12.4	15.3
3/32	5.3	9.5	13.8	17.9	22.1
7/64	7.3	12.9	18.6	24.4	30.0
1/8	9.6	16.9	24.4	31.9	39.2
9/64	12.1	21.3	30.8	40.3	49.5
5/32	14.9	26.3	37.9	49.5	61.1
3/16	21.4	37.7	54.6	72.0	88.0
1/4	38.1	68	98	127.0	157.0
5/16	59.0	105.0	152.0	198.0	244.0
1/6	86	152	220	287.0	352.0
7/16	117	205	298	390.0	480.0
1/2	153	270	390	510.0	627.0



Savings Opportunities

#5 Inappropriate Uses

- Inefficient air blow offs (cooling, chip removal, cleaning, product positioning, etc.)
-> Energy
Reduces flow
efficient nozzle!
by 50% or more
- Personal cooling
- Excessive cleaning
- Vacuum generation
- Agitators / vibration
- DTE Rebates: CA-23, Custom



Savings Opportunities

#6 Drying and Filtration

- Select your filtration and dryer based upon air quality requirement
- Use ISO 8573-1 to help determine
- Refrigerated vs. desiccant air dryer
Cycling vs. non-cycling – look at the actual energy savings
Heatless vs. heated vs. blower -
- Proper filtration, not excessive
- Expect 3-5 Δ PSIG drop across filters and dryers
- Filtration – use differential gauges, incorporate filter element changes into regular maintenance program
- CA-29, CA-30, CA-35, CA-36, CA-37, CA-38, CA-39, CA-40, CA-49, Custom



ISO 8573-1 Compressed Air Quality Classes					
Class	Max. Oil Content	Max. Particle Size		Pressure Dewpoint	
	(mg/m ³)	(μ m)	(mg/m ³)	(°C/°F)	(g/m ³)
1	0.01	0.1	0.1	-70/-94	0.003
2	0.1	1	1	-40/-40	0.12
3	1	5	5	-20/-4	0.88
4	5	15	8	3/37	6
5	25	40	10	7/45	7.8
6	--	--	--	10/50	9.4
7	--	--	--	Not Specified	



Savings Opportunities

#7 Compressed Air Drains

- ✓ Absolutely necessary to remove condensate from system
- ✓ Manual vs. timer-drain vs. zero-loss
- ✓ Maintenance vs. maintenance free
- ✓ Impacts on energy?
Zero-loss drains save approximately \$500 per year on energy each
- ✓ DTE Rebate: CA-31, Custom



References

- Compressed Air and Gas Institute (CAGI)
- Engineering Toolbox
- Sullair
- Exair
- DTE
- ISO

THANK YOU!

Any questions?

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Jeff Alstead**

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586-774-4455



Use less energy and save more with simple upgrades

Speak with an energy advisor and receive a complimentary energy efficient compressed air engineered nozzle.

Benefits include:

- Save up to \$3,600 and 72,000 kWh annually per nozzle. ¹
- OSHA safe for dead end pressure and noise level exposure standards. ²
- Decrease noise level up to 10 dBA. ²
- Reduce CFM use by 75%. ²
- Precise and repeatable drying and blow off capabilities. ²

1. MEMD 2019

2. ExAir

Contact us

phone: **866.796.0512** (option 3)
email: **DTESaveEnergy@dnv.com**

web: **dtebizrebates.com**
apply: **dteonlineapplication.com**



Barrel Wraps



TRUE NORTH

ENERGY SOLUTIONS, LLC.

Intelligent Solutions... Measurable Results!



DNV Trade Ally

Introducing a ZERO Cost Energy Savings Solution, ALL paid for by the DTE Utility Rebate... right out of the



The DTE Barrel Heater Insulation Rebate now covers **100%** of the project cost. There has never been a better time to take costs out of your business and improve your companies bottom line! [Why](#) would you wait? [What](#) if your competition didn't? It's time to take a serious look... Right Now!

Benefits & Features

- Energy Savings of 25 to 40+%
- Increased personnel comfort & safety from burn hazard
- Easy Removal & Reinstallation
- More consistent process temperatures and quicker start-up times
- Extended Heater Band Life
- Temperature Rated to 1000°F



What's Included

- Custom Design Engineered, per machine, Heavy Duty, Industrial Plastics Process Barrel Insulation System.
- Plant Personnel Training and Orientation of Insulation System Use and Installation /Removal Procedure.
- Management and Completion of the Entire Utility Rebate Application, Documentation and Approval Process.

FLIR Imaging Results

Reduced Surface Temperatures



Heat Exchanger Malfunction



Process Applications

Blow Molding



Injection Molding



Injection Molding – Large Barrel Application



Qty	1
TNAX P/N	TNAX 6806 WS
Qty	2
TNAX P/N	TNAX 6814 WS
Qty	1
TNAX P/N	TNAX 6816 WS
Qty	1
TNAX P/N	TNAX 5010 WS
Qty	1
Total Barrel Insulation Units	7

Machine ID	5
Installation Start Point	Hopper
TNAX P/N	TNAX 6314 WS
Qty	3
TNAX P/N	TNAX 6310 WS
Qty	1
Total Barrel Insulation Units	4

Machine ID	8
Installation Start Point	Hopper
TNAX P/N	TNAX 5616 WS
Qty	1
TNAX P/N	TNAX 5614 WS
Qty	1
TNAX P/N	TNAX 5606 WS
Qty	1
TNAX P/N	TNAX 5616 WS
Qty	1
TNAX P/N	TNAX 5614 WS
Qty	1
Total Barrel Insulation Units	5

Machine ID	10
Installation Start Point	Hopper
TNAX P/N	TNAX 6816 WS

Machine ID	1
Installation Start Point	Hopper
TNAX P/N	TNAX 5614 WS
Qty	4
Total Barrel Insulation Units	4

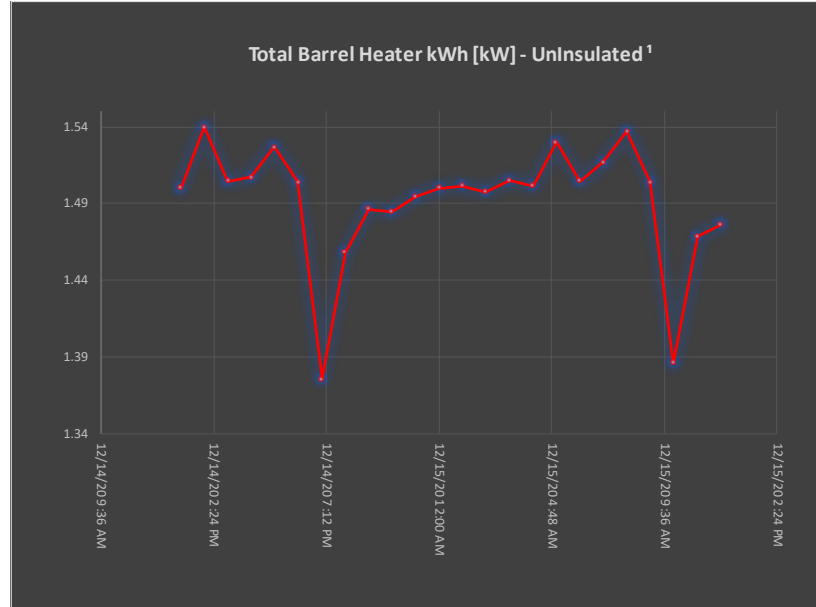
Machine ID	2
Installation Start Point	Hopper
TNAX P/N	TNAX 6312 WS
Qty	1
TNAX P/N	TNAX 6314 WS
Qty	1
TNAX P/N	TNAX 6306 WS
Qty	1
TNAX P/N	TNAX 6312 WS
Qty	3
TNAX P/N	TNAX 5010 WS
Qty	1
Total Barrel Insulation Units	7

Machine ID	3
Installation Start Point	Hopper
TNAX P/N	TNAX 6316 WS
Qty	3
TNAX P/N	TNAX 6310 WS
Qty	1
TNAX P/N	TNAX 6308 WS
Qty	1
Total Barrel Insulation Units	5

Machine ID	4
Installation Start Point	Hopper
TNAX P/N	TNAX 6812 WS
Qty	1
TNAX P/N	TNAX 6814 WS

Un-Insulated Load Profile

Date & Time	Total Barrel Heater kWh [kW] - Uninsulated
12/14/20 1:00 PM	1.50
12/14/20 2:00 PM	1.54
12/14/20 3:00 PM	1.50
12/14/20 4:00 PM	1.51
12/14/20 5:00 PM	1.53
12/14/20 6:00 PM	1.50
12/14/20 7:00 PM	1.38
12/14/20 8:00 PM	1.46
12/14/20 9:00 PM	1.49
12/14/20 10:00 PM	1.48
12/14/20 11:00 PM	1.49
12/15/20 12:00 AM	1.50
12/15/20 1:00 AM	1.50
12/15/20 2:00 AM	1.50
12/15/20 3:00 AM	1.51
12/15/20 4:00 AM	1.50
12/15/20 5:00 AM	1.53
12/15/20 6:00 AM	1.50
12/15/20 7:00 AM	1.52
12/15/20 8:00 AM	1.54
12/15/20 9:00 AM	1.50
12/15/20 10:00 AM	1.39
12/15/20 11:00 AM	1.47
12/15/20 12:00 PM	1.48



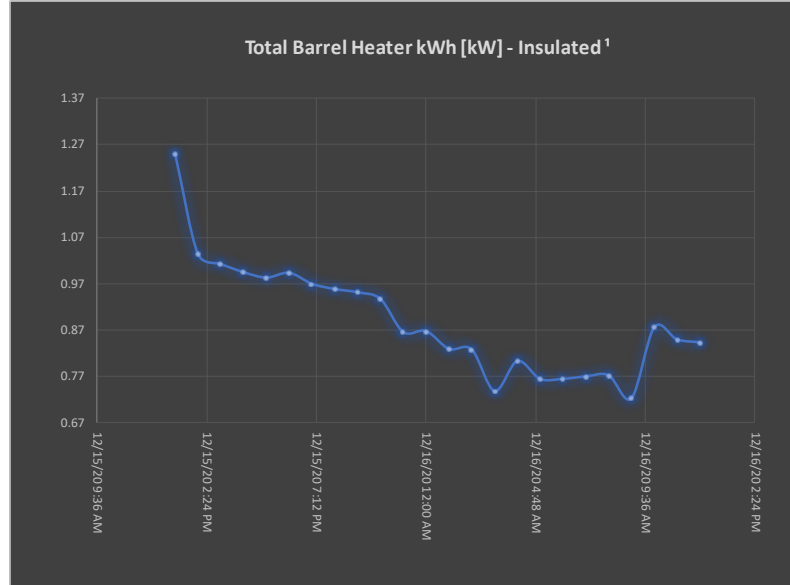
¹ Graph illustrates the electrical load profile of band heater on/off cycling over a 24 hour period.

Band Heater Energy Consumption is comprised of 2 components

1. Delivering BTU heat energy, per the defined molding process temperature, needed to convert and maintain plastic from a solid to a liquid.
2. Replacing the BTU heat energy **LOSS**, off the surface of the steel barrel, into the surrounding environment (air and objects).

Insulated Load Profile

Date & Time	Total Barrel Heater kWh [kW] - Insulated
12/15/20 1:00 PM	1.25
12/15/20 2:00 PM	1.03
12/15/20 3:00 PM	1.01
12/15/20 4:00 PM	0.99
12/15/20 5:00 PM	0.98
12/15/20 6:00 PM	0.99
12/15/20 7:00 PM	0.97
12/15/20 8:00 PM	0.96
12/15/20 9:00 PM	0.95
12/15/20 10:00 PM	0.94
12/15/20 11:00 PM	0.87
12/16/20 12:00 AM	0.87
12/16/20 1:00 AM	0.83
12/16/20 2:00 AM	0.83
12/16/20 3:00 AM	0.74
12/16/20 4:00 AM	0.80
12/16/20 5:00 AM	0.76
12/16/20 6:00 AM	0.76
12/16/20 7:00 AM	0.77
12/16/20 8:00 AM	0.77
12/16/20 9:00 AM	0.72
12/16/20 10:00 AM	0.88
12/16/20 11:00 AM	0.85
12/16/20 12:00 PM	0.84



¹ **Note:** Band Heater On/Off Cycling profile is flatter (less spikes and dips). The impact of the insulation slows the heat flow from the bare steel to the surrounding environment. All Insulation materials have a defined R Value, used in the engineering calculation to determine the products impact on BTU energy heat flow. R stands for the insulation materials resistance to heat flow!

Barrel Blanket Insulation Evaluation
Electrical Consumption Summary
Energy Data & Cooling Load Impact Calculations

Variable	Data Points (Hrs)	Total kWh During Period	Avg kWh per Hour
Uninsulated	24.00	35.81	1.49
Insulated	45.00	39.26	0.87
kWh Savings per Hour			0.62
Energy Consumption Reduced			41.5%

Energy Facts	
kWh	3,412
MCF	1,000,000
MBTU	1,000,000
BTU Energy Removed by 1 Ton of Cooling Equip	12,000

Energy Source Comparison			
Energy Type	Unit	Unit \$ ¹	\$ per MBTU
Electricity	kWh	\$0.09	\$26.38
Natural Gas	MCF	\$7.50	\$7.50

Cooling Load Impact	
kWh per Hour	0.62
Equivalent Btus per Hour	2,114.8
Equivalent Cooling Load Tons Reduced	0.18
Equipment Energy Use kW/Ton ²	1.15
Estimated Cooling Equip Operating Hrs Per Year	3,500
kWh Cooling Load Energy Savings per Year	709.34
Estimated Annual Cooling Cost Savings \$	\$63.84

¹ Based on NGas Heating Equipment System Efficiency of 80%

² Based on Manufacturer's Actual Cooling Equipment specification data

Cooling Equipment Tags

CONDENSER #1

INTERNATIONAL COMFORT PRODUCTS		MODEL CAS241LBA0A00AA...		SERIAL U131312206		ICP	
INTERNATIONAL COMFORT PRODUCTS		MODEL CAS241LBA0A00AA...		SERIAL U131312206		ICP	

COMP	QTY	VOLTS	AC	PH	HZ	FLA	LRA	REF. SYSTEM R-410A	TEST PRESSURE GADE
CONDENSER	1	480	3	60	16.7	114	12.7	125	14.7
INDOOR FAN	1	480	3	60	16.7	114	12.7	125	14.7
OUTDOOR FAN	2	480	1	60	0.8				
OUTDOOR FAN	2	480	1	60	0.8				

CHARGE SYSTEM PER INSTALLATION INSTRUCTIONS
FOR OUTDOOR INSTALLATION

CHARGER LE SYSTEME DANS LE RESPECT DES INSTRUCTIONS
D'INSTALLATION POUR UNE INSTALLATION A L'EXTERIEUR

MIN CIRCUIT AMPS 40.8

MIN UNIT DISCONNECT 42

CONTROL PANEL SCOR 3A RMS SYMMETRICAL VOLTAGE 480 MAX

ETL LISTED CONFORMS TO UL 1995, CSA C22.2 236-05

CERTIFICATION APPLIES ONLY WHEN THE COMPLETE SYSTEM IS LISTED WITH IAC

LA CERTIFICATION N'EST APPLIQUEE QUE LORSQUE L'INTEGRALITE DU SYSTEME EST CERTIFIEE

DESIGNED IN U.S.A.
ASSEMBLED IN MEXICO

ROOFTOP #1

INTERNATIONAL COMFORT PRODUCTS		MODEL RAS243LOAA0AAAAA --		SERIAL U131514423		ICP	
INTERNATIONAL COMFORT PRODUCTS		MODEL RAS243LOAA0AAAAA --		SERIAL U131514423		ICP	

COMP	QTY	VOLTS	AC	PH	HZ	FLA	LRA	REF. SYSTEM R-410A	TEST PRESSURE GADE
CONDENSER	1	480	3	60	18.6	125	20.6	125	14.7
INDOOR FAN	1	480	3	60	8.4				
OUTDOOR FAN	4	480	1	60	0.9				

CHARGE SYSTEM PER INSTALLATION INSTRUCTIONS
FOR OUTDOOR INSTALLATION

MIN CIRCUIT AMPS 40.8

MIN UNIT DISCONNECT 42

CONTROL PANEL SCOR 3A RMS SYMMETRICAL VOLTAGE 480 MAX

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DESIGNED IN U.S.A.
ASSEMBLED IN MEXICO

Energy Use & Savings Summary

Input Factors

kWh Rate	\$0.09 / kWh
Hours of Operation	7,200
Heater Band Cycle Rate	64.50%
Adjusted "Machine" Hours of Operation	4,644
Total Number of Machines	48
Total Insulation Square Foot Area	950.2

Insulation kWh Energy Use & Cost Savings Summary

Total kWh Energy Savings	1,328,613
Total Annual Savings	\$119,575.13

Air Conditioning Load & Cost Savings Summary

Estimated Cooling Load kW Demand Reduction	90.18
Estimated Cooling Equip Operating Hours per Year	3,000
Estimated Cooling Energy kWh Saved per Year	270,551
Estimated Cooling Energy Cost Savings per Year	\$24,349.56

Total Estimated Energy Cost Savings per Year	\$143,924.69
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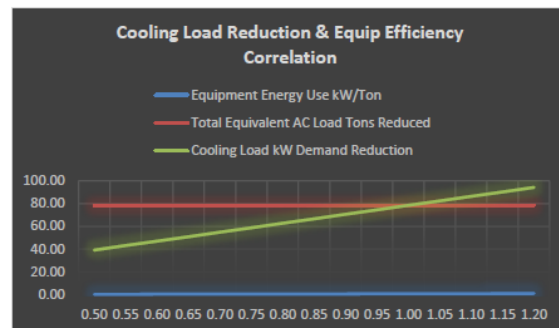
Cooling Load & kW Demand Impact

Uninsulated BTU AC Load per Hr	965,857.17
BTUs Removed per Ton AC Equipment Capacity	12,000
Equivalent AC Load Capacity (Tons)	80.49

Insulated BTU AC Load per Hr	24,811.52
Equivalent AC Load Capacity (Tons)	2.07

Total BTU AC Load per Hr Reduced	941,045.65
Total Equivalent AC Load Tons Reduced	78.42

Average Cooling System Energy Use kW/Ton *	1.15
Estimated Cooling Load kW Demand Reduction	90.18



* Based on Actual Installed Equipment Technical Specifications

Detailed Energy Analysis

ECM	Machine ID	Barrel Surface Area (SF)	Process Temp °F	Total kWh Used per Year	Annual Operating Energy Costs	BTU Heat Loss per Hour per SF	Equip. kWh per Hour per SF	Insulated Surface Contact Temp °F	Total kWh Used per Year	Annual Operating Energy Costs	BTU Heat Loss Per Hour per SF	Equip. kWh per Hour per SF	Annual kWh Savings	Annual Energy Cost \$ Savings
1	1	7	450	13,115	\$1,180.91	1,361.1	0.3987	126.9	1,156	\$104.04	120.0	0.0351	11,959	\$1,076.28
2	1.5	8	450	13,389	\$1,258.00	1,361.1	0.3987	126.9	1,233	\$110.97	120.0	0.0351	12,156	\$1,146.03
3	2	6	450	11,549	\$1,040.29	1,361.1	0.3987	126.9	1,019	\$95.69	120.0	0.0351	10,540	\$946.60
3	3	8	450	12,520	\$1,127.03	1,361.1	0.3987	126.9	1,249	\$113.29	120.0	0.0351	11,271	\$1,005.05
4	4	12	450	21,600	\$1,944.04	1,361.1	0.3987	126.9	1,904	\$173.25	120.0	0.0351	19,697	\$1,772.69
5	5	11	450	19,556	\$1,760.05	1,361.1	0.3987	126.9	1,724	\$158.14	120.0	0.0351	17,832	\$1,604.91
7	6	11	450	19,546	\$1,760.06	1,361.1	0.3987	126.9	1,760	\$158.40	120.0	0.0351	17,786	\$1,603.65
8	6.5	8	450	14,426	\$1,298.54	1,361.1	0.3987	126.9	1,266	\$116.85	120.0	0.0351	13,160	\$1,183.49
9	7	11	450	19,505	\$1,760.05	1,361.1	0.3987	126.9	1,760	\$158.40	120.0	0.0351	17,746	\$1,603.45
10	8	15	450	27,001	\$2,430.05	1,361.1	0.3987	126.9	2,430	\$218.70	120.0	0.0351	24,571	\$2,211.35
11	9	15	450	28,389	\$2,555.03	1,361.1	0.3987	126.9	2,555	\$229.95	120.0	0.0351	25,834	\$2,325.08
12	10	9	450	16,175	\$1,455.72	1,361.1	0.3987	126.9	1,456	\$131.01	120.0	0.0351	14,719	\$1,324.70
13	11	8	450	15,300	\$1,377.03	1,361.1	0.3987	126.9	1,377	\$123.93	120.0	0.0351	13,923	\$1,255.10
14	12	11	450	21,009	\$1,890.81	1,361.1	0.3987	126.9	1,891	\$170.17	120.0	0.0351	19,118	\$1,720.64
15	13	15	450	27,125	\$2,447.41	1,361.1	0.3987	126.9	2,447	\$220.27	120.0	0.0351	24,680	\$2,227.14
16	14	13	450	23,648	\$2,129.19	1,361.1	0.3987	126.9	2,129	\$191.63	120.0	0.0351	21,518	\$1,937.56
17	14.5	7	450	13,166	\$1,184.94	1,361.1	0.3987	126.9	1,185	\$106.64	120.0	0.0351	11,981	\$1,078.30
18	15	13	450	23,648	\$2,129.19	1,361.1	0.3987	126.9	2,129	\$191.63	120.0	0.0351	21,518	\$1,937.56
19	16	7	450	13,166	\$1,184.94	1,361.1	0.3987	126.9	1,185	\$106.64	120.0	0.0351	11,981	\$1,078.30
20	17	21	450	38,109	\$3,429.85	1,361.1	0.3987	126.9	3,430	\$306.69	120.0	0.0351	34,680	\$3,121.16
21	18	23	450	43,252	\$3,892.71	1,361.1	0.3987	126.9	3,893	\$350.54	120.0	0.0351	39,360	\$3,542.37
22	19	19	450	35,409	\$3,186.94	1,361.1	0.3987	126.9	3,187	\$286.81	120.0	0.0351	32,222	\$2,904.08
23	20	25	450	45,801	\$4,131.09	1,361.1	0.3987	126.9	4,131	\$372.80	120.0	0.0351	41,670	\$3,798.29
24	21	23	450	42,841	\$3,855.68	1,361.1	0.3987	126.9	3,856	\$347.01	120.0	0.0351	38,985	\$3,508.67
25	22	19	450	34,651	\$3,116.57	1,361.1	0.3987	126.9	3,119	\$280.67	120.0	0.0351	31,532	\$2,837.90
26	23	28	450	52,735	\$4,744.39	1,361.1	0.3987	126.9	4,744	\$430.99	120.0	0.0351	47,991	\$4,317.40
27	24	27	450	50,144	\$4,511.36	1,361.1	0.3987	126.9	4,513	\$406.16	120.0	0.0351	45,631	\$4,106.79
28	26	17	450	31,102	\$2,799.19	1,361.1	0.3987	126.9	2,799	\$251.93	120.0	0.0351	28,303	\$2,547.26
30	27	23	450	41,867	\$3,777.00	1,361.1	0.3987	126.9	3,777	\$339.93	120.0	0.0351	38,190	\$3,437.07
31	28	17	450	31,514	\$2,836.22	1,361.1	0.3987	126.9	2,836	\$256.36	120.0	0.0351	28,677	\$2,580.96
32	29	18	450	33,844	\$3,054.92	1,361.1	0.3987	126.9	3,055	\$274.94	120.0	0.0351	30,789	\$2,775.98
33	30	14	450	25,819	\$2,338.40	1,361.1	0.3987	126.9	2,338	\$214.95	120.0	0.0351	23,481	\$2,123.44
34	31	16	450	28,981	\$2,608.26	1,361.1	0.3987	126.9	2,608	\$234.74	120.0	0.0351	26,373	\$2,373.51
36	31.5	6	450	11,032	\$992.85	1,361.1	0.3987	126.9	993	\$89.36	120.0	0.0351	10,039	\$908.49
38	32	18	450	32,401	\$2,916.06	1,361.1	0.3987	126.9	2,916	\$262.44	120.0	0.0351	29,485	\$2,653.62
39	33	18	450	32,401	\$2,916.06	1,361.1	0.3987	126.9	2,916	\$262.44	120.0	0.0351	29,485	\$2,653.62
38	34	14	450	26,536	\$2,388.40	1,361.1	0.3987	126.9	2,388	\$214.95	120.0	0.0351	24,148	\$2,173.44
38	35	22	450	40,205	\$3,618.47	1,361.1	0.3987	126.9	3,618	\$325.66	120.0	0.0351	36,587	\$3,292.80
40	36	14	450	26,615	\$2,395.34	1,361.1	0.3987	126.9	2,395	\$215.58	120.0	0.0351	24,220	\$2,179.76
41	37	15	450	27,149	\$2,447.41	1,361.1	0.3987	126.9	2,447	\$220.27	120.0	0.0351	24,706	\$2,227.14
42	38	20	450	36,721	\$3,304.67	1,361.1	0.3987	126.9	3,305	\$297.44	120.0	0.0351	33,416	\$3,007.44
43	39	8	450	14,863	\$1,337.69	1,361.1	0.3987	126.9	1,338	\$120.39	120.0	0.0351	13,525	\$1,217.30
44	40	8	450	14,863	\$1,337.69	1,361.1	0.3987	126.9	1,338	\$120.39	120.0	0.0351	13,525	\$1,217.30
45	41	21	450	39,344	\$3,540.34	1,361.1	0.3987	126.9	3,541	\$318.68	120.0	0.0351	35,803	\$3,232.25
46	42	11	450	21,150	\$1,903.54	1,361.1	0.3987	126.9	1,904	\$171.32	120.0	0.0351	19,247	\$1,792.22
47	43	23	450	41,967	\$3,777.00	1,361.1	0.3987	126.9	3,777	\$339.93	120.0	0.0351	38,190	\$3,437.07
48	44	21	450	38,109	\$3,429.85	1,361.1	0.3987	126.9	3,430	\$306.69	120.0	0.0351	34,680	\$3,121.16
48	45	14	450	26,615	\$2,395.34	1,361.1	0.3987	126.9	2,395	\$215.58	120.0	0.0351	24,220	\$2,179.76
50	46	11	450	21,086	\$1,891.76	1,361.1	0.3987	126.9	1,898	\$170.17	120.0	0.0351	19,188	\$1,720.96
51	47	10	450	17,022	\$1,532.26	1,361.1	0.3987	126.9	1,540	\$140.90	120.0	0.0351	15,482	\$1,440.96
52	48	29	450	54,744	\$4,936.36	1,361.1	0.3987	126.9	4,837	\$435.33	120.0	0.0351	49,907	\$4,401.04



Energy Use & Financial Impact Summary

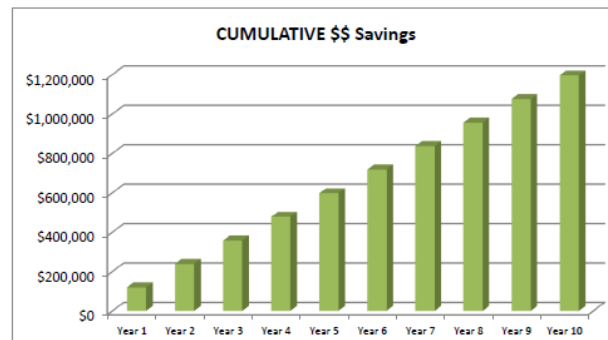
Total Gross Project Cost	\$95,019.44
DTE Energy Prescriptive Rebate Net	\$95,019.44
Project Cost	\$0.00

Total Number of Machines	48
Total Insulation Square Foot Area	950.2
kWh Rate	\$0.090
Hours of Operation	7,200
Heater Band Cycle Rate	64.50%
Adjusted "Machine" Hours of Operation	4,644
Annual KWH Energy Saved	1,328,613

Estimated Annual Energy Savings	\$119,575.13
Payback (Months)	0.00
Monthly Cost of Waiting	\$9,964.59

10 Year Cash Flow Analysis

YEAR	YEARLY SAVINGS	YEARLY COST	CUMULATIVE CASH FLOW
Year 1	\$119,575.13	\$0.00	\$119,575.13
Year 2	\$119,575.13	\$0.00	\$239,150.26
Year 3	\$119,575.13	\$0.00	\$358,725.39
Year 4	\$119,575.13	\$0.00	\$478,300.52
Year 5	\$119,575.13	\$0.00	\$597,875.65
Year 6	\$119,575.13	\$0.00	\$717,450.78
Year 7	\$119,575.13	\$0.00	\$837,025.91
Year 8	\$119,575.13	\$0.00	\$956,601.04
Year 9	\$119,575.13	\$0.00	\$1,076,176.17
Year 10	\$119,575.13	\$0.00	\$1,195,751.30
Totals	\$1,195,751.29	\$0.00	\$1,195,751.30

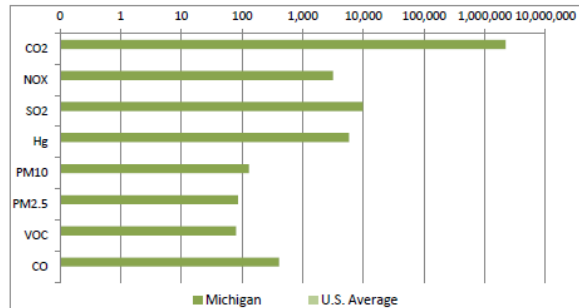


Impact on Carbon Footprint

Annual Energy Savings:

1,328,613 kWh

<i>Environmental Gas Reductions (in pounds)</i>	<i>Michigan</i>	<i>U.S. Average</i>
Carbon Dioxide (CO ₂):	2,225,426	2,590,794
Nitrogen Oxide (NO _x):	3,153	5,437
Sulfur Dioxide (SO ₂):	9,789	11,263
Mercury (Hg):	5,779	22,321
Particulate Matter (PM10):	130	238
Particulate Matter (PM2.5):	86	134
Volatile Organic Compounds (VOC):	80	58
Carbon Monoxide (CO):	411	468



Environmental Impact of either:

Automobiles removed from the road:	193
Number of new trees planted:	3338



Project Benefits Summary

Annual Energy Savings (KWH)	1,328,613
Estimated Annual Utility \$ Savings	\$119,575.13
Estimated Utility Rebate Incentive	\$95,019.44
10 Year Positive Cash Flow	\$1,195,751.30
Annual (Pounds) Reduction of CO2	2,225,426
Heated Surface Temperature Reduction	323.1

Additional Intrinsic Benefits & Features

- Operator Safety - Burn Hazard Injury Reduction
- Improved Operator Comfort & Potential Productivity
- Improved Surface Temperature Stability & Process Control
- Reduced Heater Band On/Off Cycles
- Reduced Summer Time Indoor Temperatures

Q & A



Thank you!



New Barrel Wrap Incentive - Apply Now!

Due to changing market conditions and customer demand, we are increasing the rebate amount on injection molding machine barrel wraps to \$75 per square foot installed. Improve your bottom line today and get up to 40% in energy savings with barrel wraps.

Barrel wrap insulation can minimize heat radiation from injection molding and extrusion machine barrels. These wraps are simply held in place by straps and the installation cost is minimal. In addition to improved safety and easy maintenance, wraps can reduce heat energy load.

Any DTE electric customer may participate. Final applications must be submitted by November 30, 2022. Applications must be submitted via the DTE online application in order to qualify.



Contact us

phone: 866.796.0512 (option 3)
email: DTESaveEnergy@dnv.com

web: dtebizrebates.com
apply: dteonlineapplication.com



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Apply online (current applications): dteonlineapplication.com

Apply online (new applications): mienergyrebates.com