

197 State Route 18, Suite 3000 S. East Brunswick, New Jersey 08819 www.MechanicalinsulatorsLMCT.com

Pete Ielmini, Executive Director 732-210-7084 Gina Walsh, Deputy Director 314-683-6136

The following pages will outline a case study, which shows the benefits in energy and cost savings of properly installed mechanical insulation.

Insulation is a proven means for conserving energy, reducing greenhouse gas emissions, increasing process productivity, providing a safer and more productive work environment, controlling condensation (which can lead to mold growth), supporting sustainable design technology and a host of other benefits.

Mechanical insulation does all of this, while providing a return on investment (ROI) rate, which is seldom rivaled. Despite the proven ROI, insulation is often overlooked and its benefits undervalued. Insulation is truly the lost or forgotten technology. Can you think of a more important time than now to think about how insulation can help you?

An insulation system is a technology, which needs to be engineered and maintained throughout the entire process. Several studies have estimated roughly 10 to 30 percent of all installed insulation is now missing or damaged.

The practice of not replacing or maintaining an insulation system in a timely and correct manner reduces the full benefits of insulation, and in return, decreases the ROI. In many cases, significant other issues - such as excessive energy loss, corrosion under insulation (CUI), mold development, increased cost of operations and reduced process productivity or efficiency - develop.

You can learn more on www.MechanicalInsulatorsLMCT.com, where additional case studies can be viewed.

Please do not hesitate to contact me should you have any additional questions. Thank you,

Peter Ielimi

Executive Director

Mechanical Insulators Labor Management Cooperative Trust

ENERGY AUDIT ECOLE MARIE ESTHER



Total Heat Loss

5 year savings of

\$ 227,734.95

CO₂ Reduction of 148.82 MT/Year

Benefits:

- Simple payback period
- CO₂ Reduction
- Personnel safety

Audit Done By:

Joshua Sherrard

Certified Thermographer

Certified 3E Plus Auditor





Operating Temperature, Ambient Temperature, Insulation selected 150*F 81*F Fiberglass Emittance of Surface Expected Useful Life of Insulation System Operating hours per year Efficiency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	2,325	\$ 69.27	\$79.71	\$398.55	0.21
1	351	\$10.44	\$69.27	\$346.35	0.03
1.5	273	\$ 8.10	\$71.61	\$358.05	0.03





Operating Temperature,
Ambient Temperature,
Insulation selected

150*F 81 *F Fiberglass

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	4,650	\$ 138.54	\$138.54	\$692.70	0.42
1	702	\$ 20.88	\$117.66	\$588.30	0.06
1.5	546	\$ 16.20	\$122.34	\$611.70	0.06





Operating Temperature, Ambient Temperature, Insulation selected 200*F 81*F Fiberglass Emittance of Surface
Expected Useful Life of Insulation System
Operating hours per year
Efficiency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	21,432	\$ 638.64	\$638.64	\$3193.20	2.16
1	3,384	\$ 100.80	\$537.84	\$2689.20	0.24
1.5	2,760	\$ 82.32	\$556.32	\$2781.60	024





0.95

20 yrs.

8320

75%

Operating Temperature, Ambient Temperature, Insulation selected 240*F 81*F Fiberglass

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	23,895	\$ 711.99	\$711.99	\$3559.95	2.34
1	3,132	\$ 93.33	\$618.66	\$3093.30	0.27
1.5	2,160	\$ 64.35	\$647.64	\$3238.20	0.18

^{*}Estimated Calculations supplied by 3E Plus Mechanical Insulation Energy Calculator *





Operating Temperature, Ambient Temperature, Insulation selected 245*F 81 *F Fiberglass

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	109,368	\$ 3,259.26	\$3,259.26	\$16,296.30	10.62
1	13,662	\$ 406.98	\$2,852.28	\$14,261.40	1.26
1.5	9,918	\$ 295.56	\$2,963.70	\$14,818.50	0.9

^{*}Estimated Calculations supplied by 3E Plus Mechanical Insulation Energy Calculator *





Operating Temperature, Ambient Temperature, Insulation selected 240*F 81*F Fiberglass

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	33,360	\$ 994.20	\$994.20	\$4971.00	3.3
1	4,545	\$ 135.30	\$858.90	\$4294.50	0.45
1.5	3,510	\$ 104.55	\$889.65	\$4448.25	0.3





Operating Temperature, Ambient Temperature, Insulation selected 180*F 81*F Fiberglass

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	16,260	\$ 484.56	\$484.56	\$2422.80	1.56
1	2,008	\$ 59.88	\$424.68	\$2123.40	0.2
1.5	1,472	\$ 43.92	\$440.64	\$2203.20	0.16

^{*}Estimated Calculations supplied by 3E Plus Mechanical Insulation Energy Calculator *





Operating Temperature, Ambient Temperature, Insulation selected 180*F 74*F Fiberglass

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	18,966	\$ 565.14	\$565.14	\$2825.70	1.86
1	2,520	\$ 75.09	\$490.05	\$2450.25	0.24
1.5	1,836	\$ 54.66	\$510.48	\$2552.40	0.18





Operating Temperature,
Ambient Temperature,
Insulation selected

180*F 74*F Fiberglass

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	18,966	\$565.14	\$565.14	\$2825.70	1.86
1	2,520	\$ 75.06	\$490.08	\$2450.40	0.24
1.5	1,836	\$ 54.66	\$510.48	\$2552.40	0.18





0.95

8320

75%

20 yrs.

Operating Temperature, Ambient Temperature, Insulation selected 190*F 74*F Fiberglass

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	64,890	\$ 1,933.95	\$1,933.95	\$9,669.75	6.3
1	7,965	\$ 237.45	\$1,696.50	\$8,482.50	0.75
1.5	5,850	\$ 174.15	\$1,759.80	\$8,799.00	0.6





Operating Temperature, Ambient Temperature, Insulation selected

245*F 81*F Fiberglass Emittance of Surface Expected Useful Life of Insulation System Operating hours per year Efficiency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	18,228	\$ 543.21	\$543.21	\$2716.05	1.77
1	2,277	\$ 67.83	\$475.38	\$2376.90	0.21
1.5	1,653	\$ 49.26	\$493.95	\$2469.75	0.15

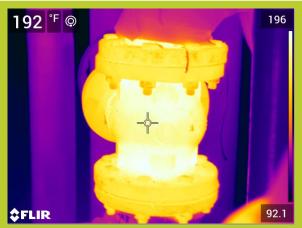




Operating Temperature, Ambient Temperature, Insulation selected 215*F 81*F Fiberglass Emittance of Surface
Expected Useful Life of Insulation System
Operating hours per year
Efficiency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	5,337	\$ 159.00	\$159.00	\$795.00	0.51
1	741	\$ 22.08	\$136.92	\$684.60	0.06
1.5	573	\$ 17.07	\$141.93	\$709.65	0.06





Operating Temperature, Ambient Temperature, Insulation selected 230*F 81*F Fiberglass Emittance of Surface
Expected Useful Life of Insulation System
Operating hours per year
Efficiency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	55,072	\$ 1,641.12	\$1,641.12	\$8,205.60	5.36
1	6,464	\$ 192.64	\$1,448.48	\$7,242.40	0.64
1.5	4,728	\$ 140.96	\$1,500.16	\$7,500.80	0.48

0.95

8320 75%

20 yrs.





Operating Temperature, Ambient Temperature, Insulation selected

215*F 81*F Fiberglass ittance of Surface ected Useful Life of Insulation System erating hours per year ciency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	11,829	\$ 352.53	\$352.53	\$1762.65	1.14
1	1,506	\$ 44.85	\$307.68	\$1538.40	0.15
1.5	1,110	\$ 33.12	\$319.41	\$1597.05	0.12





Operating Temperature, Ambient Temperature, Insulation selected 208*F 81*F Fiberglass Emittance of Surface
Expected Useful Life of Insulation System
Operating hours per year
Efficiency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
		7/ 1/	3AVIII 03.	SAVIIIOS	
0	49,938	\$ 1,488.06	\$1,488.06	\$7,440.30	4.83
1	6,636	\$ 197.61	\$1,290.45	\$6,452.25	0.63
1.5	4,977	\$ 148.26	\$1,339.80	\$6,699.00	0.42



HEAT LOSS

68,925

6,825

4,750



0.95

75%

20 yrs. 8320

Operating Temperature, Ambient Temperature, Insulation selected

THICKNESS

0

1

1.5

210*F 81*F Fiberglass

FUEL COST

\$/yr

\$ 2,054.00

\$ 203.75

\$ 141.25

Emittance of Surface
Expected Useful Life of Insulation System
Operating hours per year
Efficiency of fuel Conversion%

1styr

SAVINGS.

\$2,054.00

\$1,850.25

\$1,912.75

5yr.	CO2
SAVINGS	EMMISSIONS
\$10,270.00	6.75
\$9,251.25	0.75
\$9.563.75	0.5





Operating Temperature, Ambient Temperature, Insulation selected

208*F 81*F Fiberglass Emittance of Surface
Expected Useful Life of Insulation System
Operating hours per year
Efficiency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	9,540	\$ 248.12	\$248.12	\$1240.60	0.96
1	1,764	\$ 52.44	\$195.68	\$978.40	0.12
1.5	1,368	\$ 40.92	\$207.20	\$1036.00	0.12





Operating Temperature, Ambient Temperature, Insulation selected 153*F 81*F Fiberglass Emittance of Surface Expected Useful Life of Insulation System Operating hours per year Efficiency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	24,312	\$ 724.48	\$724.48	\$3622.40	2.32
1	3,112	\$ 92.64	\$631.84	\$3159.20	0.32
1.5	2,272	\$ 67.76	\$656.72	\$3283.60	0.24





Operating Temperature, Ambient Temperature, Insulation selected 210*F 81*F Fiberglass Emittance of Surface
Expected Useful Life of Insulation System
Operating hours per year
Efficiency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	20,316	\$ 605.64	\$605.64	\$3028.20	1.92
1	2,832	\$ 84.48	\$521.16	\$2605.80	0.24
1.5	2,196	\$ 65.28	\$540.36	\$2701.80	0.24

^{*}Estimated Calculations supplied by 3E Plus Mechanical Insulation Energy Calculator *





Operating Temperature, Ambient Temperature, Insulation selected 208*F 81*F Fiberglass Emittance of Surface
Expected Useful Life of Insulation System
Operating hours per year
Efficiency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	11,037	\$ 328.86	\$328.86	\$1644.30	1.08
1	1,413	\$ 42.12	\$286.74	\$1433.70	0.15
1.5	1,044	\$ 31.11	\$297.75	\$1488.75	0.09





Operating Temperature, Ambient Temperature, Insulation selected 180*F 81*F Fiberglass Emittance of Surface Expected Useful Life of Insulation System Operating hours per year Efficiency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	21,780	\$ 649.08	\$649.08	\$3245.40	2.16
1	3,132	\$ 93.42	\$555.66	\$2778.30	0.36
1.5	2,430	\$ 72.36	\$576.72	\$2883.60	0.18





Operating Temperature, Ambient Temperature, Insulation selected 180*F 81*F Fiberglass Emittance of Surface Expected Useful Life of Insulation System Operating hours per year Efficiency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	9,483	\$ 282.57	\$282.57	\$1412.85	0.93
1	1,260	\$ 37.53	\$245.04	\$1225.20	0.12
1.5	918	\$ 27.33	\$255.24	\$1276.20	0.09





Operating Temperature, Ambient Temperature, Insulation selected

180*F 81*F Fiberglass Emittance of Surface Expected Useful Life of Insulation System Operating hours per year Efficiency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	4,329	\$ 129.00	\$129.00	\$645.00	0.42
1	600	\$ 17.91	\$111.09	\$555.45	0.06
1.5	417	\$ 12.39	\$116.61	\$583.05	0.03





Operating Temperature, Ambient Temperature, Insulation selected 180*F 81*F Fiberglass Emittance of Surface
Expected Useful Life of Insulation System
Operating hours per year
Efficiency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	3,630	\$ 108.18	\$108.18	\$540.90	0.36
1	522	\$ 15.57	\$92.61	\$463.05	0.06
1.5	405	\$ 12.06	\$96.12	\$480.60	0.03





Operating Temperature, Ambient Temperature, Insulation selected 180*F 81*F Fiberglass Emittance of Surface
Expected Useful Life of Insulation System
Operating hours per year
Efficiency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	16,260	\$ 484.56	\$484.56	\$2422.80	1.56
1	2,008	\$ 59.88	\$424.68	\$2123.40	0.2
1.5	1,472	\$ 43.92	\$440.64	\$2203.20	0.16





Operating Temperature, Ambient Temperature, Insulation selected 238*F 81*F Fiberglass Emittance of Surface
Expected Useful Life of Insulation System
Operating hours per year
Efficiency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	17,199	\$ 512.55	\$512.55	\$2562.75	1.65
1	2,160	\$ 64.32	\$448.23	\$2241.15	0.21
1.5	1,569	\$ 46.71	\$465.84	\$2329.20	0.15





Operating Temperature, Ambient Temperature, Insulation selected

204*F 81*F Fiberglass Emittance of Surface
Expected Useful Life of Insulation System
Operating hours per year
Efficiency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	5,652	\$ 168.39	\$168.39	\$841.95	0.54
1	1,053	\$ 31.41	\$136.98	\$684.90	0.09
1.5	855	\$ 25.47	\$142.92	\$714.60	0.09





Operating Temperature, Ambient Temperature, Insulation selected 235*F 81*F Fiberglass Emittance of Surface Expected Useful Life of Insulation System Operating hours per year Efficiency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	11,616	\$ 346.14	\$346.14	\$1730.70	1.11
1	1,425	\$ 42.42	\$303.72	\$1518.60	0.15
1.5	1,077	\$ 32.07	\$314.07	\$1570.35	0.09

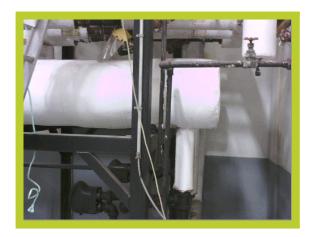




Operating Temperature, Ambient Temperature, Insulation selected

210*F 81*F Fiberglass Emittance of Surface
Expected Useful Life of Insulation System
Operating hours per year
Efficiency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	89,140	\$ 2,656.30	\$2,656.30	\$13,281.50	8.6
1	12,660	\$ 377.20	\$2,279.10	\$11,395.50	1.2
1.5	8,870	\$ 264.40	\$2,391.90	\$11,959.50	0.9





Operating Temperature, Ambient Temperature, Insulation selected 210*F 81*F Fiberglass Emittance of Surface
Expected Useful Life of Insulation System
Operating hours per year
Efficiency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	46,044	\$ 1,372.20	\$1,372.20	\$6,861.00	4.44
1	6,840	\$ 203.64	\$1,168.56	\$5,842.80	0.72
1.5	4,968	\$ 148.08	\$1,224.12	\$6,120.60	0.48

Gym Ventilation





Operating Temperature, Ambient Temperature, Insulation selected 210*F 81*F Fiberglass Emittance of Surface
Expected Useful Life of Insulation System
Operating hours per year
Efficiency of fuel Conversion%

20 yrs. 8320 75%

0.95

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	19,524	\$ 581.82	\$581.82	\$2909.10	1.86
1	2,880	\$ 85.80	\$496.02	\$2480.10	0.3
1.5	2,124	\$ 63.36	\$518.46	\$2592.30	0.18

Gym Ventilation





Operating Temperature, Ambient Temperature, Insulation selected 150*F 81*F Fiberglass Emittance of Surface
Expected Useful Life of Insulation System
Operating hours per year
Efficiency of fuel Conversion%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2 EMMISSIONS
		\$/yr	SAVINGS.	SAVINGS	
0	15,976	\$ 476.00	\$476.00	\$2380.00	1.52
1	2,544	\$ 75.76	\$400.24	\$2001.20	0.24
1.5	1,784	\$ 53.20	\$422.80	\$2114.00	0.16

Results	
Simple Payback Period, yrs	0.6
Internal Rate of Return (IRR or ROI)	156.1%
Net Present Value,	\$881,746

Calculations							
Year	Investment	Annual Savings	Annual Cash Flow	Cumulative Cash Flow			
0	\$-29,174	\$0	\$-29,174	\$-29,174			
1	\$0	\$45,546	\$45,546	\$16,372			
2	\$0	\$45,546	\$45,546	\$61,918			
3	\$0	\$45,546	\$45,546	\$107,464			
4	\$0	\$45,546	\$45,546	\$153,010			
5	\$0	\$45,546	\$45,546	\$198,556			
6	\$0	\$45,546	\$45,546	\$244,102			
7	\$0	\$45,546	\$45,546	\$289,648			
8	\$0	\$45,546	\$45,546	\$335,194			
9	\$0	\$45,546	\$45,546	\$380,740			
10	\$0	\$45,546	\$45,546	\$426,286			
11	\$0	\$45,546	\$45,546	\$471,832			
12	\$0	\$45,546	\$45,546	\$517,378			
13	\$0	\$45,546	\$45,546	\$562,924			
14	\$0	\$45,546	\$45,546	\$608,470			
15	\$0	\$45,546	\$45,546	\$654,016			
16	\$0	\$45,546	\$45,546	\$699,562			
17	\$0	\$45,546	\$45,546	\$745,108			
18	\$0	\$45,546	\$45,546	\$790,654			
19	\$0	\$45,546	\$45,546	\$836,200			
20	\$0	\$45,546	\$45,546	\$881,746			