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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 FLORENCEVILLE MIDDLE

Total Heat Loss
5 year savings of
\$ 51,301.70

CO₂ Reduction of
36.21 MT/Year

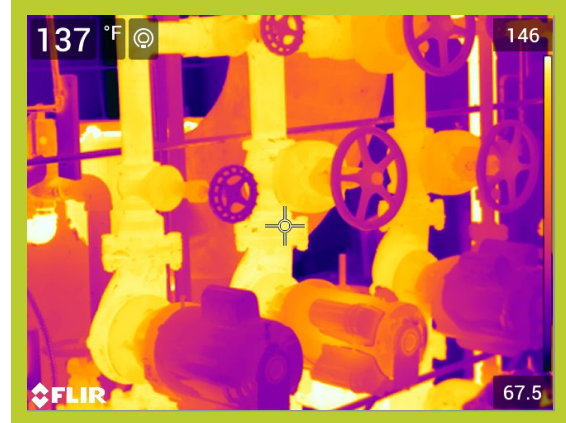
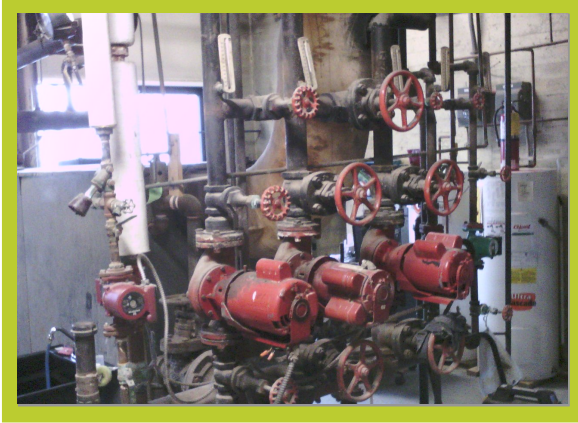


Benefits:

- Simple payback period
- CO₂ Reduction
- Personnel safety

*Audit Done By:
Joshua Sherrard
Certified Thermographer
Certified 3E Plus Auditor*

Boiler Room



Operating Temperature,	148°F	Emittance of Surface	0.95
Ambient Temperature,	70°F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	18,423	\$ 486.63	\$ 486.63	\$2433.15	1.71
1	2,556	\$ 67.59	\$419.04	\$2095.20	0.27
1.5	1,863	\$ 49.32	\$437.31	\$2186.55	0.18

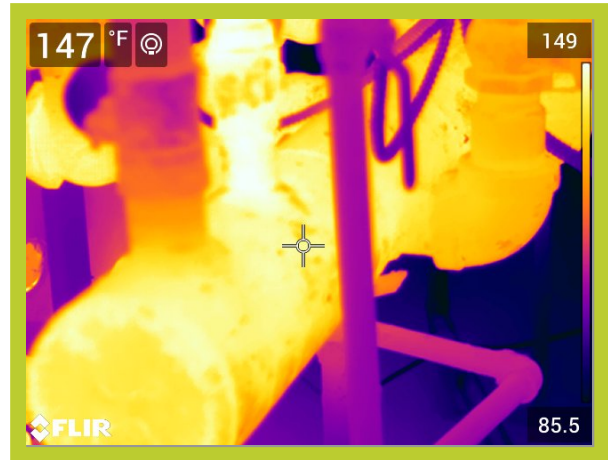
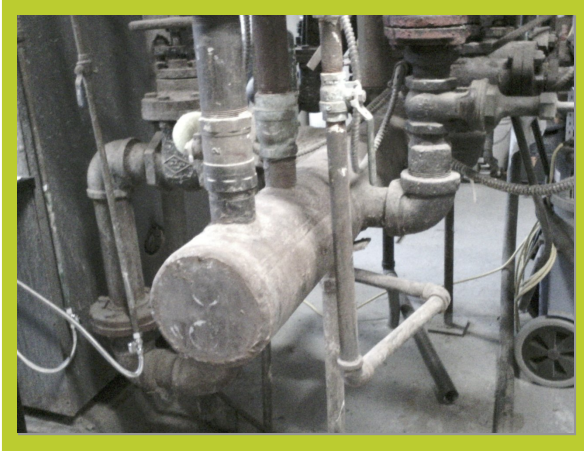
Boiler Room



Operating Temperature,	142°F	Emittance of Surface	0.95
Ambient Temperature,	70°F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	16,575	\$ 437.55	\$ 437.55	\$2187.75	1.5
1	2,370	\$ 62.70	\$374.85	\$1874.25	0.15
1.5	1,785	\$ 47.25	\$390.30	\$1951.50	0.15

Boiler Room



Operating Temperature,
Ambient Temperature,
Insulation selected

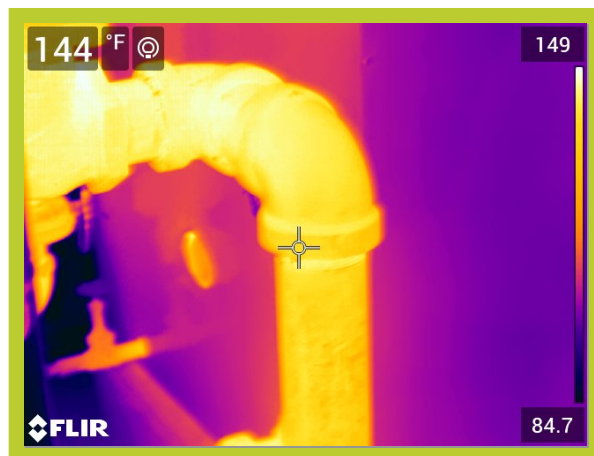
143°F
70°F
Fiberglass

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

0.95
20 yrs.
8320
75%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	13,800	\$ 364.38	\$ 364.38	\$1821.90	1.26
1	1,869	\$ 50.10	\$314.28	\$1571.40	0.18
1.5	1,332	\$ 35.16	\$329.22	\$1646.10	0.12

Boiler Room



Operating Temperature,
Ambient Temperature,
Insulation selected

146°F
70°F
Fiberglass

Emittance of Surface

0.95

Expected Useful Life of Insulation System

20 yrs.

Operating hours per year

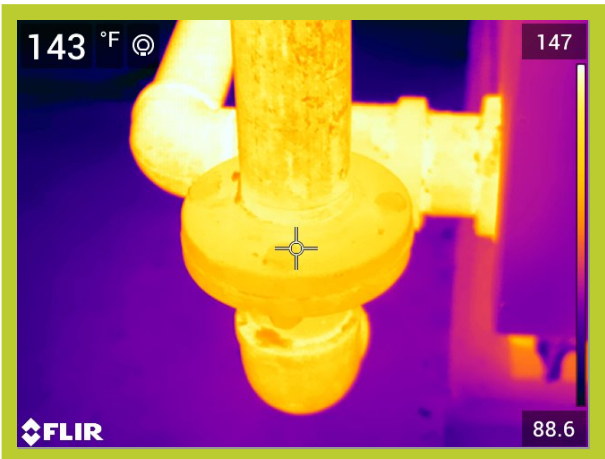
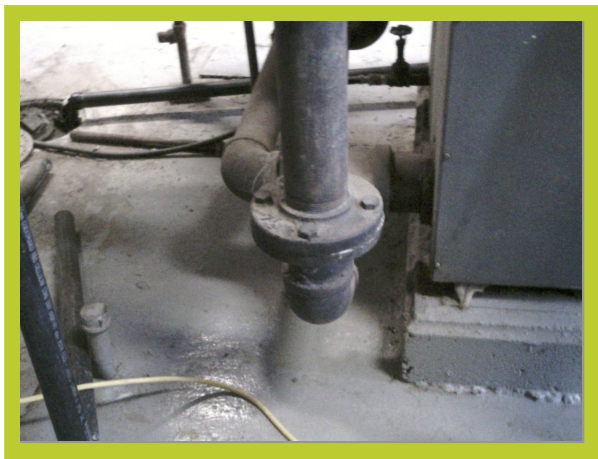
8320

Efficiency of fuel Conversion%

75%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	5,478	\$ 144.66	\$ 144.66	\$723.30	0.51
1	753	\$ 19.86	\$124.80	\$624.00	0.06
1.5	558	\$ 14.70	\$129.96	\$649.80	0.06

Boiler Room



Operating Temperature,
Ambient Temperature,
Insulation selected

145°F
70°F
Fiberglass

Emittance of Surface 0.95
Expected Useful Life of Insulation System 20 yrs.
Operating hours per year 8320
Efficiency of fuel Conversion% 75%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	27,352	\$ 722.32	\$ 722.32	\$3611.60	2.48
1	3,648	\$ 96.40	\$625.92	\$3129.60	0.32
1.5	2,448	\$ 64.72	\$657.60	\$3288.00	0.24

Boiler Room

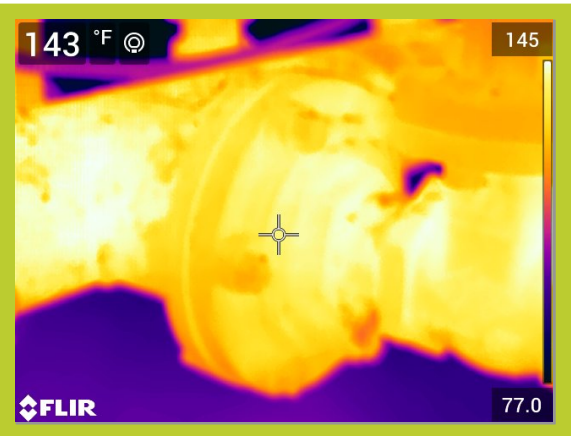
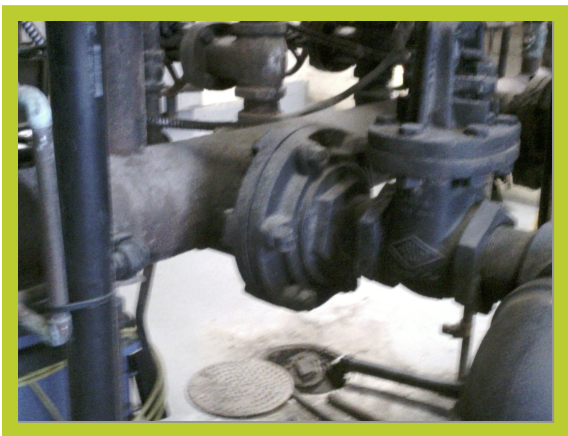


Operating Temperature, 145°F
Ambient Temperature, 70°F
Insulation selected Fiberglass

Emittance of Surface 0.95
Expected Useful Life of Insulation System 20 yrs.
Operating hours per year 8320
Efficiency of fuel Conversion% 75%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	20,706	\$ 546.63	\$ 546.63	\$2733.15	1.89
1	2,982	\$ 78.75	\$467.88	\$2339.40	0.21
1.5	2,058	\$ 54.60	\$492.03	\$2460.15	0.21

Boiler Room

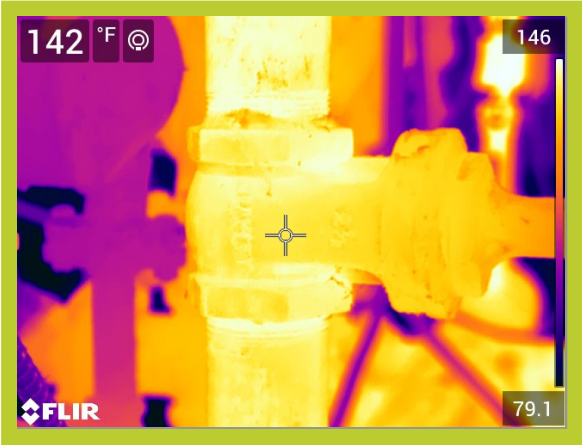


Operating Temperature,	145°F	Emittance of Surface	0.95
Ambient Temperature,	70°F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	4,191	\$ 110.67	\$ 110.67	\$553.35	0.39
1	567	\$ 15.00	\$95.67	\$478.35	0.06
1.5	432	\$ 11.37	\$99.30	\$496.50	0.03

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

Boiler Room



Operating Temperature,	135°F	Emittance of Surface	0.95
Ambient Temperature,	70°F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	2,583	\$68.25	\$ 68.25	\$341.25	0.21
1	630	\$ 16.80	\$51.45	\$257.25	0
1.5	525	\$ 13.65	\$54.60	\$273.00	0

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

Boiler Room



Operating Temperature,	123°F	Emittance of Surface	0.95
Ambient Temperature,	70°F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	4,413	\$ 116.52	\$ 116.52	\$582.60	0.39
1	594	\$ 15.96	\$100.56	\$502.80	0.06
1.5	450	\$ 11.91	\$104.61	\$523.05	0.03

Boiler Room



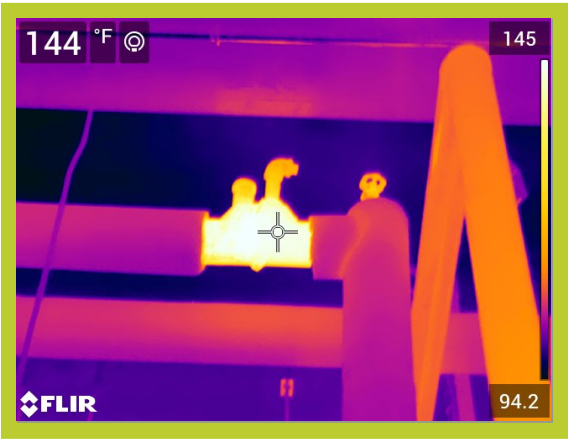
Operating Temperature,
Ambient Temperature,
Insulation selected

145°F
70°F
Fiberglass

Emittance of Surface 0.95
Expected Useful Life of Insulation System 20 yrs.
Operating hours per year 8320
Efficiency of fuel Conversion% 75%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	25,056	\$ 661.20	\$ 661.20	\$3306.00	2.61
1	4,437	\$ 117.45	\$543.75	\$2718.75	0.27
1.5	3,654	\$ 95.70	\$565.50	\$2827.50	0.27

Boiler Room



Operating Temperature, Ambient Temperature, Insulation selected	120°F 70°F Fiberglass	Emittance of Surface Expected Useful Life of Insulation System Operating hours per year Efficiency of fuel Conversion%	0.95 20 yrs. 8320 75%
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THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	11,268	\$ 297.54	\$ 297.54	\$1487.70	0.99
1	1,548	\$ 40.77	\$256.77	\$1283.85	0.18
1.5	1,170	\$ 30.96	\$266.58	\$1332.90	0.09

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

Boiler Room



Operating Temperature,
Ambient Temperature,
Insulation selected

136°F
70°F
Fiberglass

Emittance of Surface

0.95

Expected Useful Life of Insulation System

20 yrs.

Operating hours per year

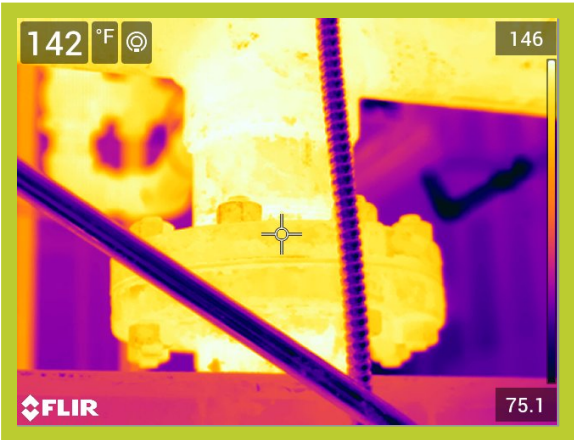
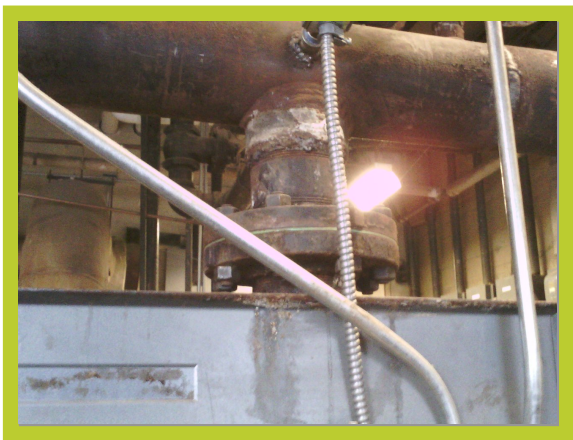
8320

Efficiency of fuel Conversion%

75%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	35,805	\$ 945.78	\$ 945.78	\$4728.90	3.3
1	5,148	\$ 135.63	\$810.15	\$4050.75	0.33
1.5	3,861	\$ 102.30	\$843.48	\$4217.40	0.33

Boiler Room



Operating Temperature,
Ambient Temperature,
Insulation selected

141°F
70°F
Fiberglass

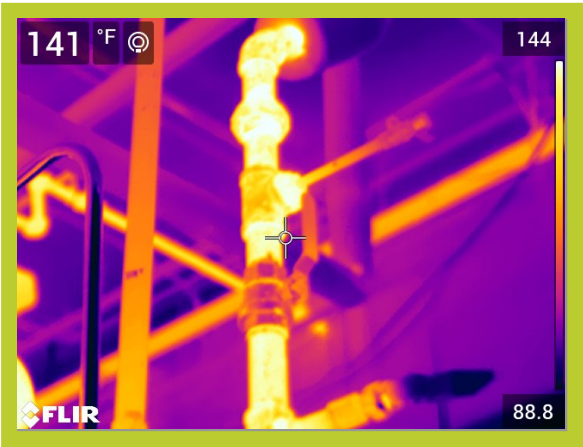
Emittance of Surface
Expected Useful Life of Insulation System
Operating hours per year
Efficiency of fuel Conversion%

0.95
20 yrs.
8320
75%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	9,984	\$ 263.64	\$ 263.64	\$1318.20	0.92
1	1,300	\$ 34.28	\$229.36	\$1146.80	0.12
1.5	952	\$ 25.20	\$238.44	\$1192.20	0.08

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

Boiler Room



Operating Temperature,
Ambient Temperature,
Insulation selected

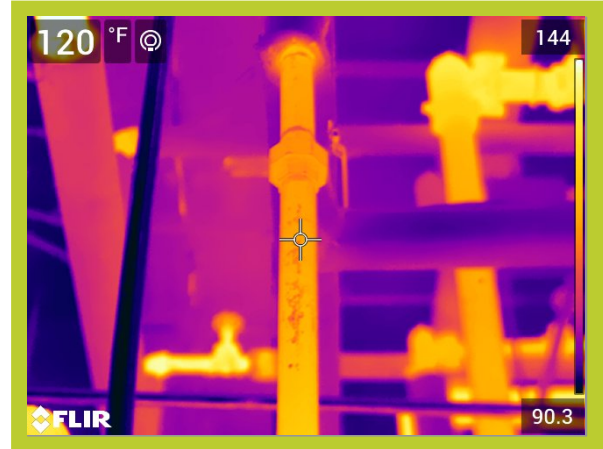
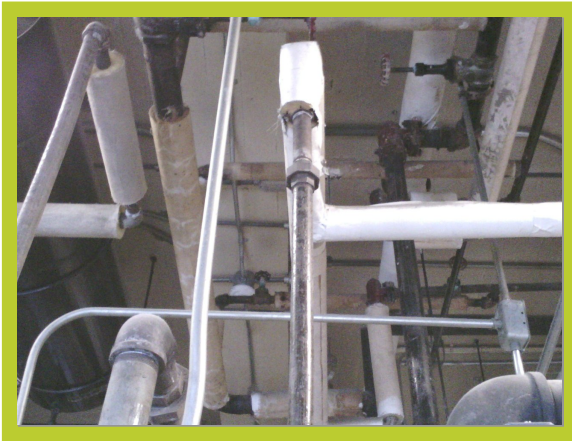
141°F
70°F
Fiberglass

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

0.95
20 yrs.
8320
75%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	10,668	\$ 281.64	\$ 281.64	\$1408.20	0.96
1	1,560	\$ 41.04	\$240.60	\$1203.00	0.12
1.5	1,080	\$ 28.44	\$253.20	\$1266.00	0.12

Mechanical Room



Operating Temperature,
Ambient Temperature,
Insulation selected

140°F
70°F
Fiberglass

Emittance of Surface

0.95

Expected Useful Life of Insulation System

20 yrs.

Operating hours per year

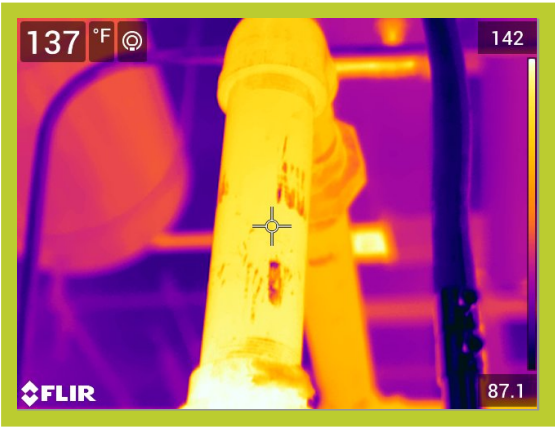
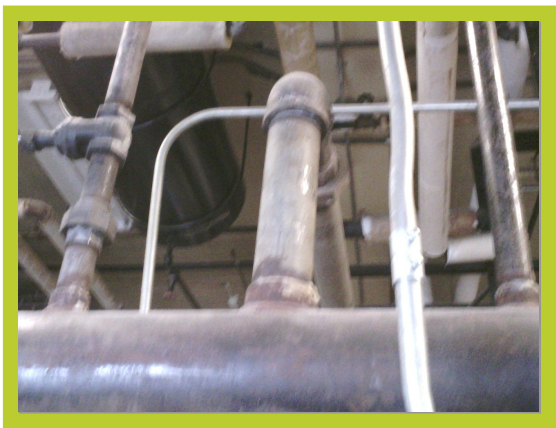
8320

Efficiency of fuel Conversion%

75%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	1,842	\$ 48.66	\$ 48.66	\$243.30	0.18
1	414	\$ 10.92	\$37.74	\$188.70	0.06
1.5	324	\$ 8.58	\$40.08	\$200.40	0

Mechanical Room



Operating Temperature,	141°F	Emittance of Surface	0.95
Ambient Temperature,	70°F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	1,548	\$ 40.89	\$ 40.89	\$204.45	0.15
1	279	\$ 7.38	\$33.51	\$167.55	0.03
1.5	222	\$ 5.88	\$35.01	\$175.05	0.03

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

Mechanical Room



Operating Temperature,	150°F	Emittance of Surface	0.95
Ambient Temperature,	70°F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMISSIONS
0	21,912	\$ 578.49	\$ 578.49	\$2892.45	1.98
1	3,432	\$ 90.75	\$487.74	\$2438.70	0.33
1.5	2,739	\$ 71.94	\$506.55	\$2532.75	0.33

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

Mechanical Room



Operating Temperature,	145°F	Emittance of Surface	0.95
Ambient Temperature,	70°F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	8,826	\$ 233.04	\$ 233.04	\$1165.20	0.78
1	1,188	\$ 31.38	\$201.66	\$1008.30	0.12
1.5	900	\$ 23.82	\$209.22	\$1046.10	0.06

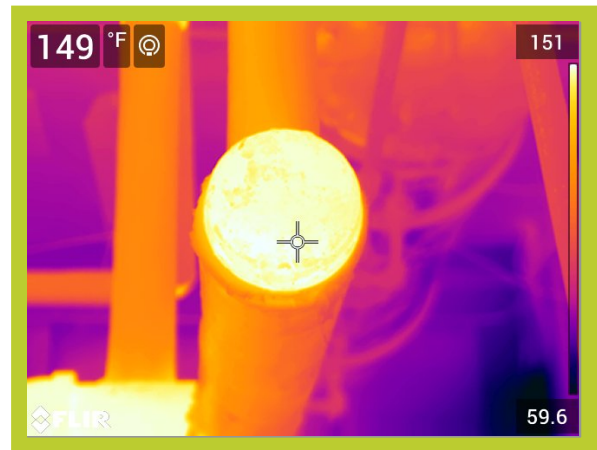
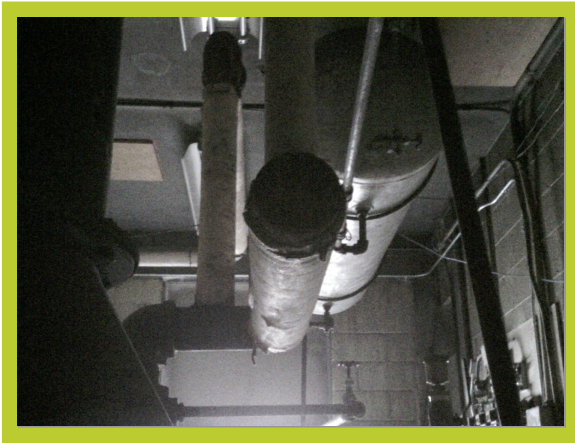
Mechanical Room



Operating Temperature,	146°F	Emittance of Surface	0.95
Ambient Temperature,	70°F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMISSIONS
0	13,482	\$ 355.74	\$ 355.74	\$1778.70	1.26
1	2,121	\$ 56.07	\$299.67	\$1498.35	0.21
1.5	1,680	\$ 44.52	\$311.22	\$1556.10	0.21

Mechanical Room



Operating Temperature,
Ambient Temperature,
Insulation selected

140°F
70°F
Fiberglass

Emittance of Surface

0.95

Expected Useful Life of Insulation System

20 yrs.

Operating hours per year

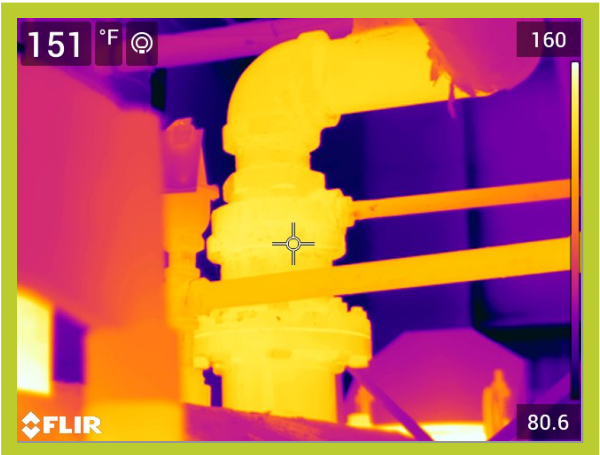
8320

Efficiency of fuel Conversion%

75%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	17,052	\$ 450.36	\$ 450.36	\$2251.80	1.56
1	2,304	\$ 60.96	\$389.40	\$1947.00	0.24
1.5	1,752	\$ 46.20	\$404.16	\$2020.80	0.12

Mechanical Room



Operating Temperature,	143°F	Emittance of Surface	0.95
Ambient Temperature,	70°F	Expected Useful Life of Insulation System	20 yrs.
Insulation selected	Fiberglass	Operating hours per year	8320
		Efficiency of fuel Conversion%	75%

THICKNESS	HEAT LOSS	FUEL COST	1styr	5yr.	CO2
		\$/yr	SAVINGS.	SAVINGS	EMMISSIONS
0	9,360	\$ 247.16	\$ 247.16	\$1235.80	0.84
1	1,284	\$ 33.92	\$213.24	\$1066.20	0.12
1.5	900	\$ 23.80	\$84.87	\$424.35	0.08

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

Mechanical Room



Operating Temperature,
Ambient Temperature,
Insulation selected

143°F
70°F
Fiberglass

Emittance of Surface

0.95

Expected Useful Life of Insulation System

20 yrs.

Operating hours per year

8320

Efficiency of fuel Conversion%

75%

THICKNESS	HEAT LOSS	FUEL COST \$/yr	1styr SAVINGS.	5yr. SAVINGS	CO2 EMMISSIONS
0	20,295	\$ 535.89	\$ 535.89	\$2679.45	1.98
1	3,135	\$ 82.83	\$453.06	\$2265.30	0.33
1.5	2,442	\$ 64.35	\$471.54	\$2357.70	0.33

Results

Simple Payback Period, yrs	1.7
Internal Rate of Return (IRR or ROI)	59.0%
Net Present Value,	\$187,824

Calculations

Year	Investment	Annual Savings	Annual Cash Flow	Cumulative Cash Flow
0	\$-17,376	\$0	\$-17,376	\$-17,376
1	\$0	\$10,260	\$10,260	\$-7,116
2	\$0	\$10,260	\$10,260	\$3,144
3	\$0	\$10,260	\$10,260	\$13,404
4	\$0	\$10,260	\$10,260	\$23,664
5	\$0	\$10,260	\$10,260	\$33,924
6	\$0	\$10,260	\$10,260	\$44,184
7	\$0	\$10,260	\$10,260	\$54,444
8	\$0	\$10,260	\$10,260	\$64,704
9	\$0	\$10,260	\$10,260	\$74,964
10	\$0	\$10,260	\$10,260	\$85,224
11	\$0	\$10,260	\$10,260	\$95,484
12	\$0	\$10,260	\$10,260	\$105,744
13	\$0	\$10,260	\$10,260	\$116,004
14	\$0	\$10,260	\$10,260	\$126,264
15	\$0	\$10,260	\$10,260	\$136,524
16	\$0	\$10,260	\$10,260	\$146,784
17	\$0	\$10,260	\$10,260	\$157,044
18	\$0	\$10,260	\$10,260	\$167,304
19	\$0	\$10,260	\$10,260	\$177,564
20	\$0	\$10,260	\$10,260	\$187,824