



CASE STUDY — AVEDON ENGINEERING, INC., LONGMONT, CO

For the past several years, Ray Avedon has been developing the Airius Thermal Equalizer product line to reduce the effects of heat rising to the ceiling, thus reduce the related excess energy consumption while improving the air environment in a facility. This document summarizes a case study of the impact of installing Airius Thermal Equalizers in two facilities of the parent company, Avedon Engineering, Inc., both located in Longmont, CO. The two facilities are (1) 711 S. Lincoln Street, a manufacturing facility and (2) 811 S. Sherman Street, a tool room and the corporate office.

The Lincoln facility is approximately 55,000 sq. ft. with a maximum ceiling height of approximately 35 feet. Over 70 percent of this facility is a production area with high ceilings. Since May 2004, twenty two (22) Airius Thermal Equalizer units have been installed and are operating in the production area. These units run 24 – 7 – 365 days a year.

The Sherman facility is a combination of a large tool room, approximately 16,000 sq. ft. with a maximum ceiling height of 31 feet and several overhead cranes. The remaining 29,000 sq. ft. is a combination of corporate offices with maximum ceiling height of 10 feet and locker rooms, workshops and laboratories with ceiling heights of a maximum of approximately 15 feet. Fourteen Airius Thermal Equalizer units have been installed in the tool room. Additional Airius Thermal Equalizer units, approximately 10, have been installed in suspended ceilings in offices and free-hanging units in workshops and laboratories representing approximately 10,000 sq. ft. These units run 24 – 7 – 365 days a year.

Following is a summary of the energy reduction realized from May 2004 though April 2005 compared with the average annual energy usage in these two facilities for the prior five years. The information includes historical energy usage and average temperature provided by Xcel Energy.

The total temperature degree days in Longmont, CO from May 2004 to April 2005 is exactly the same as the total average annual degree days for the prior 5 years.

The energy reduction in therm usage from May 2004 to April 2005 compared to the average annual therm usage in the prior five years in both the 711 South Lincoln facility and the 811 South Sherman facility are both in excess of 60 percent.

711 S. Lincoln St.	68.8 percent reduction in therm usage
811 S. Sherman St.	62.4 percent reduction in therm usage

The energy reduction in therm usage in the two facilities results in an estimated energy cost savings of almost \$30,000 for the May 2004 to April 2005 time period. This assumes an average cost of \$.60 per therm.

711 S. Lincoln St.	\$21,806
811 S. Sherman St.	8,124

Total	\$29,930
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The life cycle payback for the product cost and the cost of installation for both buildings is approximately one year.

711 S. Lincoln St.	0.70 years
811 S. Sherman St.	2.07 years
Both Facilities Combined	1.07 years

The addition of the Airius Thermal Equalizers is the only energy reduction capital equipment improvement made to these two facilities since April 2004.

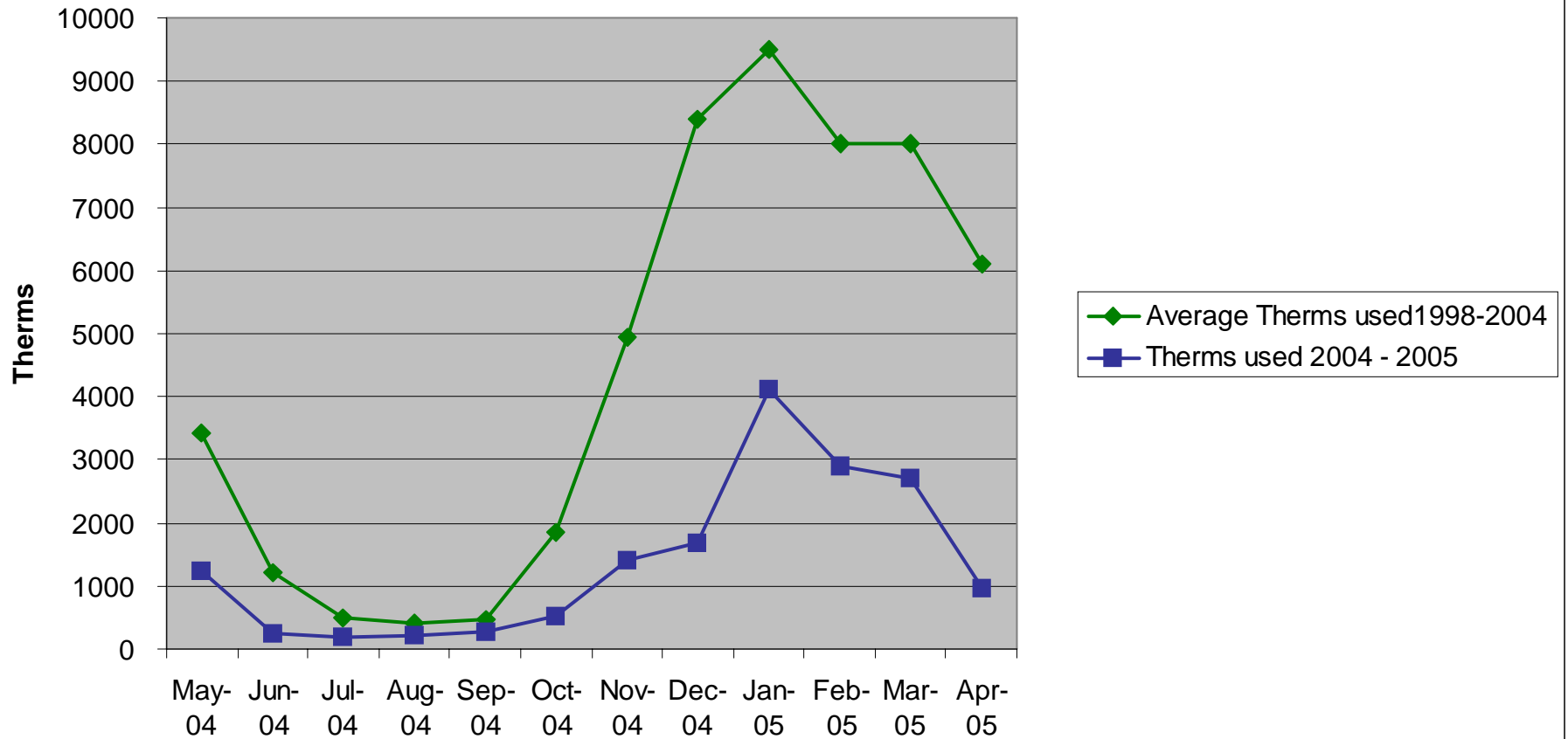
711 S. Lincoln Gas Savings

Therms Used 711 S Linclon													
	May-04	Jun-04	Jul-04	Aug-04	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	
Average Therms used 1998-2004	3436	1222	486	428	461	1844	4946	8400	9508	8005	8013	6112	52,862
Therms used 2004 - 2005	1249	250	190	231	274	536	1398	1695	4126	2909	2695	966	16,519
Gas Savings	2187	972	296	197	187	1308	3548	6705	5382	5096	5318	5146	36343
Percent change	-63.6%	-79.5%	-60.9%	-46.0%	-40.5%	-70.9%	-71.7%	-79.8%	-56.6%	-63.7%	-66.4%	-84.2%	-68.8%
Savings @ \$.60/Therm													\$21,806
Average degree days Longmont CO													
	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	
Average Degree Days 1998-2004	54	65	73	75	71	58	46	35	32	32	39	46	
Degree Days 2004 - 2005	56	62	70	71	67	56	45	36	36	38	41	48	
Difference	2	-3	-3	-4	-4	-2	-1	1	4	6	2	2	0

Product Cost	\$ 8,690	Estimated Annual Savings	\$21,806
Estimated Installation Cost	\$ 6,600	Estimated Simple Payback	.70 years
Total Cost	\$15,290		

Note: The rapid simple payback of the Lincoln facility is augmented by the harvesting of the heated air rising to the ceiling from the manufacturing process and returned to the floor by the Airius Thermal Equalizers, thus balancing the ceiling and floor temperatures.

711 S Linclon Gas Savings



811 S. Sherman Street Gas Savings

Therms Used 811 S. Sherman	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	
Average Therms used 1998-2004	1516	877	479	381	382	708	1420	3307	4517	3533	2732	1852	21,704
Therms used 2004 - 2005	144	29	22	14	18	58	623	1702	1996	1374	1403	781	8,164
Difference	1372	848	457	367	364	650	797	1605	2521	2159	1329	1071	13540
Percent change	-90.5%	-96.7%	-95.4%	-96.3%	-95.3%	-91.8%	-56.1%	-48.5%	-55.8%	-61.1%	-48.6%	-57.8%	-62.4%
Savings @ \$.60/Therm	\$823	\$509	\$274	\$220	\$218	\$390	\$478	\$963	\$1,513	\$1,295	\$797	\$643	\$8,124
Average degree days Longmont CO													
	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	
Average Degree Days 1998-2004	54	65	73	75	71	58	46	35	32	32	39	46	626
Degree Days 2004 - 2005	56	62	70	71	67	56	45	36	36	38	41	48	626
Difference	2	-3	-3	-4	-4	-2	-1	1	4	6	2	2	0

Product Cost	\$ 9,640	Estimated Annual Savings	\$8,124
Estimated Installation Cost	\$ 7,200	Estimated Simple Payback	2.07 years

Total Cost	\$16,840		
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711 S. Lincoln Street Total Cost	\$15,290		
811 S. Sherman Street Total cost	16,840		

Total	\$32,130		
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Total Estimated Energy Cost Savings	\$29,930		
Estimated Combined Simple Payback	1.07 years		

AEI 811 S. Sherman St. - Average Therms Used

