

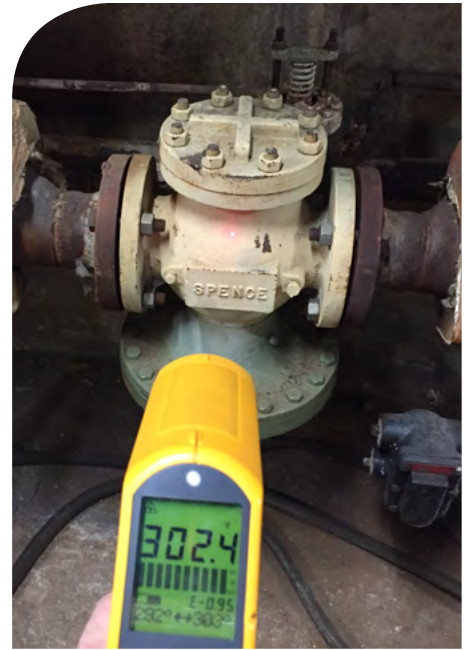
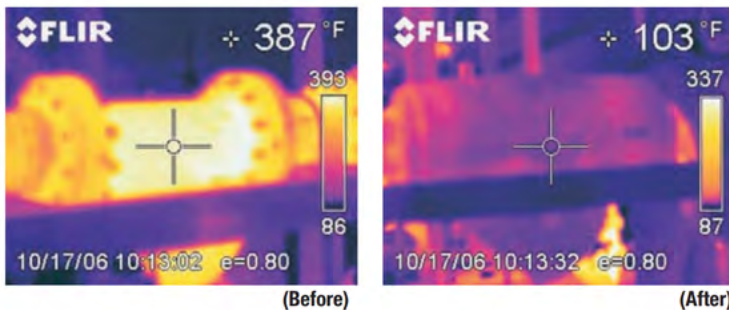
Energy Survey Services

Introduction: Shannon's insulation program improves insulation performance on steam systems, where the existing insulation has been removed and never replaced. Shannon blankets deliver immediate energy savings, with the benefits of quick installation, removal and reinstallation. Problem insulation areas can now be addressed with a highly functional insulation system.

A Unique Insulation System: The Shannon Thermal Blanket System delivers energy savings through a high quality insulation, custom fit to match gate valves, pressure reducing valves, flanges, strainers, steam traps, heat exchanger heads, boiler heads, PRV stations, condensate pumps and similar equipment. This blanket system is CAD designed to match every fitting. We guarantee the fit; the blanket carries an 18-month warranty.

Payback on Investment is about One Year: A typical Energy Survey will show a payback period on investment of roughly one to two years. The enclosed Energy Survey proposal shows an initial investment of \$31,031.01 -- a payback period of 10 months. An annual savings of \$37,895.60 per year and a lifetime savings of \$537,402.96. See *Energy Survey Sample* on back cover.

Added Benefits: The Shannon Blanket Systems will improve steam system efficiency and lower ambient temperature in mechanical rooms, tunnels, manholes and more. Shannon Blanket Systems will also reduce the possibility of employee burns from steam fittings.



I-R GUN CAPTURED TEMPERATURES



BOILER HEAD STEAM DRUM
Design: Steam Drum
Retrofitted with Blanket
Fastener: Stainless Steel Wiretwists



THERMAL



ACOUSTIC



SAFETY

Engineering Reusable Solutions for a Sustainable Planet

Thermal Blanket Insulation

Re-install the blanket one time and it has paid for itself: Shannon Blanket Systems are a practical solution to problem insulation areas. If the installed blanket is removed just one time, the blanket cost is justified by the cost associated with reinstallation of other insulation materials. The blanket can be removed and reused numerous times, in minutes vs. hours. The blanket will also minimize down time associated with reinsulation and removal.

How do we initiate an Energy Survey? Your project representative will contact Shannon to arrange a site visit. A Shannon sales engineer will meet with you and the project representative at the site to walk through the steam system. The sales engineer will tally a descriptive list of candidates for insulation; a list of fittings, valves, flanges and equipment. The survey may be 140 fittings or more depending on the work required and system size. The survey may require added site visits to ensure the proposal includes all the opportunities. Shannon will search for surface temperatures greater than 250°F.

Installation: The Energy Survey proposal includes installation. This assures the customer a quality fit and a blanket system installed in a timely fashion and as a turn-key project. The blanket system may be installed by an outside field service mechanic or by Shannon. Either way, the blanket system will match the existing insulation system with good thermal performance.

What do we cover? The Energy Survey proposal will include every opportunity on the steam system that represents a realistic payback, usually between one to two years. Our interest is "Return on Investment." The Shannon Blanket System insulates piping, valves and equipment where otherwise bare surface conditions would be the norm. Our approach to Energy Savings is tangible, with a minimum 15-year service life and virtually no maintenance.



BOILER ROOM – MAIN HP STEAM HEADER GATE VALVES & VALVE BONNETS
Design: LT450TT - 1.5" thickness
Fastener: Stainless Steel Wiretwists and Velcro® Flaps



STEAM TO HOT WATER HEAT EXCHANGER
Design: LT450TT-1 ½" Thickness
Fastener: Stainless Steel Wiretwists / Velcro® Flaps



CONDENSATE PUMP / RECEIVER

Design: LT450TT-1" Thickness

Fastener: Stainless Steel Wiretwists / Velcro® Flaps



MAIN MECHANICAL ROOM

HP STEAM SUPPLY PRV STATION

Design: LT450TT – Yellow PTFE Fabric

Fastener: Stainless Steel Wiretwists and Velcro® Flaps



HP STEAM - 4" 300# GATE VALVE

Design: LT450TT-1 1/2" Thickness

Fastener: Non-Metallic Side Release Buckle / Strap



STEAM CONDENSATE PUMP & RECEIVER

Design: LT450TT - 1" thickness

Fastener: Stainless Steel Wiretwists and Velcro® Flaps



MP-LP STEAM PRV STATIONS

Design: LT450SS

Fastener: Stainless Steel Wiretwists / Velcro Flaps



**BOILER ROOM – FEED WATER PUMP,
PIPING & VALVES**

Design: LT450SS - 1.5" thickness

Fastener: Stainless Steel Wiretwists and Velcro® Flaps

Energy Survey Sample

Presented By: Shannon
 Phone / Email: (716) 693-7954
 Project Name: Sample Steam System
 Shannon Proj. #: 2535
 Survey Date: 9/22/2019

Fuel Cost (\$/mmBTU): \$9.60
 Steam Cost: \$12.80
 Product Specification: (M) LT450TT
 Insulation Thickness: 1.5
 Fastener Type: (M) Velcro Flaps / Wiretwists

QTY	Description / Location	Amb. Temp	Meas. Surface Temp	Operating Hours	Bare Heat Loss (BTU/Hr)	Bare Oper. Cost (\$/Year)	Insulated Heat Loss (BTU/Yr)	Insulated Oper. Cost (\$/Year)
Main Boiler Room								
3	Valve, Gate, 150#	90	360	8760	23,916.06	\$2,681.66	18,439,324	\$236.02
3	6" 300# Stop Check Valve	90	360	8760	39,463.20	\$4,424.93	30,426,196	\$389.46
6	44" Dia. Steam Drum (6"-10")	90	345	8760	108,201.60	\$12,132.43	93,449,607	\$1,196.15
6	44" Dia. Mud Drum (6"-10" Deep)	90	330	8760	101,836.80	\$11,418.76	87,952,571	\$1,125.79
Steam Header								
6	Valve, Gate, 150#	90	350	8760	23,362.56	\$2,619.60	20,177,355	\$258.27
4	Valve, Globe, 150#	90	350	8760	15,575.04	\$1,746.40	13,451,570	\$172.18
2	Flange, 150#	90	345	8760	10,874.53	\$1,219.34	9,391,920	\$120.22
Steam Tunnel								
6	Exp. Joint, Single	90	342	5834	22,837.25	\$1,705.38	13,135,599	\$168.14
4	Valve, Gate, 150#	90	342	5834	18,321.41	\$1,368.15	10,538,164	\$134.89
3	Blind Flange Cap, 300#	90	338	5834	7,928.06	\$592.03	4,560,088	\$58.37
PRV Station to Deaerator								
1	Strainer, 150#	110	325	8760	3,219.84	\$361.03	2,780,853	\$35.59
1	Pressure Reducing Valve, 150#	110	325	8760	6,123.20	\$686.58	5,288,375	\$67.69
1	Valve, Globe, 150#	110	315	8760	3,070.08	\$344.24	2,651,511	\$33.94
1	Flange, 150#	110	315	8760	2,784.90	\$312.27	2,405,213	\$30.79
1	Valve, Gate, 150#	110	315	8760	3,070.08	\$344.24	2,651,511	\$33.94

Heatloss Calculation

$$Q = K (\Delta T) / L + (K / Ht)$$

Q = Heatloss (BTU / Hr. / SF)
 K = Bare Surface Thermal Conductivity (K = 26.9)
 ΔT = Surface Temp - Ambient Temp
 L = Insulation Thickness
 K = Insulated Surface Thermal Conductivity (K = 0.525 @ 300 F)
 Ht = Combined Coefficients (Ht = 3.2 @ 300 F)
 (Radiation, Convection & Conduction):

Emissions Savings #1		Emissions Savings #2	
Natural Gas (mm BTU): 2960.59		#6 Fuel Oil (mm BTU): 2960.59	
CO2 (Tons)	444.21	CO2 (Tons)	264.43
NOx (lbs)	444.21	NOx (lbs)	1163.55
N2O (lbs)	6.42	N2O (lbs)	*
SO2 (lbs)	1.66	SO2 (lbs)	3318.72
PM10 (lbs)	5.47	PM10 (lbs)	211.40
VOC (lbs)	15.93	VOC (lbs)	34.01
CO (lbs)	71.10	CO (lbs)	105.82
* (Amount is less than 0.05 Lbs)			

Energy Survey Summary

Total Heatloss - Bare (BTU/Year):	3,277,893,469.42
Total Heatloss - w/ Insulation (BTU/Year):	317,299,858.47
Heatloss Savings - w/ Thermal Blanket (BTU/Year):	2,960,593,610.95
Total Annual Operating (Steam Cost) - Bare:	\$41,957.04
Total Annual Operating (Steam Cost) - w/ Insulation:	\$4,061.44
Annual (Steam Cost) Savings - w/ Thermal Blanket:	\$37,895.60
* Lifetime (Steam Cost) Savings (15 Yrs):	\$537,402.96
Total Cost (INSULTECH® Blanket System):	\$26,231.01
Installation (By Shannon):	\$4,800.00
Total Cost:	\$31,031.01
Payback (Months):	10
Number of Fittings:	48

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