

# Reducing Steam Heat Loss

## Example Energy Saving Analysis

### using Department of Energy (DOE) Heat Loss Table for Uninsulated Steam Line

Uninsulated steam distribution and condensate return lines are a constant source of wasted energy. The DOE table shows typical heat loss from uninsulated steam distribution lines. According to the DOE, insulation can typically reduce energy losses by up to 90% and help ensure proper steam pressure at plant equipment.

Heat Loss Per 100 Feet of Uninsulated Steam Line				
Distribution Line Diameter, inches	Heat Loss Per 100 Feet of Uninsulated Steam Line, MMBtu/yr			
	Steam Pressure, psig			
	15	150	300	600
1	140	285	375	495
2	235	480	630	840
4	415	850	1,120	1,500
8	740	1,540	2,030	2,725
12	1,055	2,200	2,910	3,920

Based on horizontal steel pipe, 75°F ambient air, no wind velocity, and 8,760 operating hours per year.

#### Example

In a plant where the fuel cost is \*\$4.399 per million Btu (\$4.399/MMBtu), a survey of the steam system identified 2,500 feet (ft) of bare 2-inch-diameter steam line operating at 150 pounds per square inch gauge (psig). An additional 2,500 ft of bare 8-inch-diameter line operating at 15 psig was found. From the table, the quantity of heat lost per year is:

2-inch line: 2,200 ft x 480 MMBtu/yr per 100 ft = 10,560 MMBtu/yr  
 8-inch line: 2,200 ft x 740 MMBtu/yr per 100 ft = 16,280 MMBtu/yr  
**Total Heat Loss = 26,840 MMBtu/yr**

Given a boiler efficiency of 80%, the **annual cost savings** from installing 90% efficient insulation is:

$$(0.90 \times \$4.399/\text{MMBtu} \times 26,840 \text{ MMBtu/yr})/0.80 = \$132,828$$



**Using the Nansulate® Ultimate Insulation Solution (UIS)**  
**This customer would save \$132,828 per year.**

**Product Cost would be: (\$5.75 x 5,757 S.F.) = \$33,102.75**  
**Estimated Payback: 3 months**  
**Ongoing Monthly Energy Savings: \$11,069**



\*Pricing as of Friday, 1/07/11: NYMEX Natural Gas Futures for February delivery closed at \$4.399 per MMBtu.

Note: Individual results will vary based upon environment and process temperatures.