



from experience

Steam Leak Cost Evaluation

Just as compressed air leaks in a plant (November 2011) can lead to significant wasted energy costs, unchecked steam leaks can also be costly for plants. For example, a 1/32" hole in a 125 psig steam line will leak about 4 pounds of steam per hour, wasting approximately \$300 per year in natural gas. As with air losses, this can add up quickly: 20 such leaks would cost nearly \$6,000 per year.

To calculate steam leak costs, we used the following formula:

$$\text{Cost/year} = (\text{steam loss, lb/hr}) \times (\text{heat value of the steam, Btu/lb}) \times (\$/\text{MM Btu}) \times (1/\text{boiler efficiency}) \times (\text{hrs/yr}) \times (\text{number of leaks})$$

Calculating the example given above assumes that:

- 1/32" leak = 4 lb/hr (see table, Experience in Brief)
- Heat value of steam = 1190 Btu/lb
- Natural gas costs = \$6/MM Btu
- Boiler system efficiency = 85%
- Boiler in operation = 8,760 hrs/yr (24/7/52)
- Number of leaks = 20

Therefore:

$$\text{Cost} = 4 \text{ lb/hr} \times 1190 \text{ Btu/lb} \times 6.00 \text{ MM Btu}/1,000,000 \times (1/.85) \times 8,760 \text{ hrs/yr.} \times 20 = \$5,890 \text{ per year.}$$

Beyond helping to justify steam leak abatement maintenance programs, this calculation can also be useful when looking to validate sustainability measures for the plant.

DECEMBER 2011

experience in brief

Natural Gas Wasted from Steam Leaks

Hole Diameter (in)	Steam Loss (lb/hr)	Natural Gas Loss (MM Btu/yr)
1/32	4	50
1/16	15	190
1/8	60	740
1/4	250	3,100
3/8	550	6,800
1/2	980	12,100

Assumptions: 125 psig;
85% boiler system efficiency

continuing education

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"Fastrak Revit Integrator"
Webinar
October 2011

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