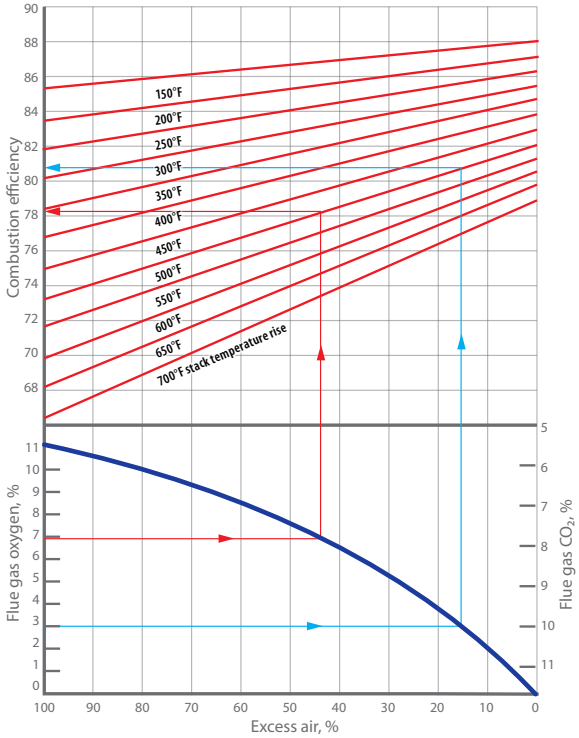
Better Plants
U.S. DEPARTMENT OF ENERGY

Steam System *Info Card*

Top 10 Energy Conservation Measures

1. Inspect and repair steam traps
2. Insulate steam distribution and condensate return lines and cover heated open vessels
3. Install condensing economizers
4. Use feedwater economizers for waste heat recovery
5. Minimize boiler blowdown
6. Recover heat from boiler blowdown
7. Replace pressure-reducing valves with backpressure turbogenerators
8. Use low-grade waste steam to power absorption chillers
9. Upgrade boilers with energy-efficient burners
10. Optimize the air-to-fuel ratio to improve combustion efficiency

Natural Gas Combustion Efficiency Curve



Source: Energy Management Handbook, 4th Edition, Fairmont Press 2001

Rules of Thumb

1. Every 40°F increase in the combustion air temperature improves efficiency by roughly 1%
2. Every 40°F increase in stack temperature results roughly 1% efficiency loss

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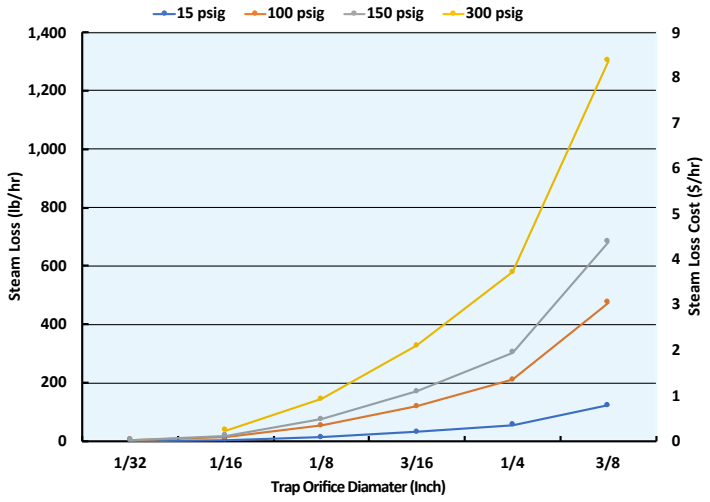
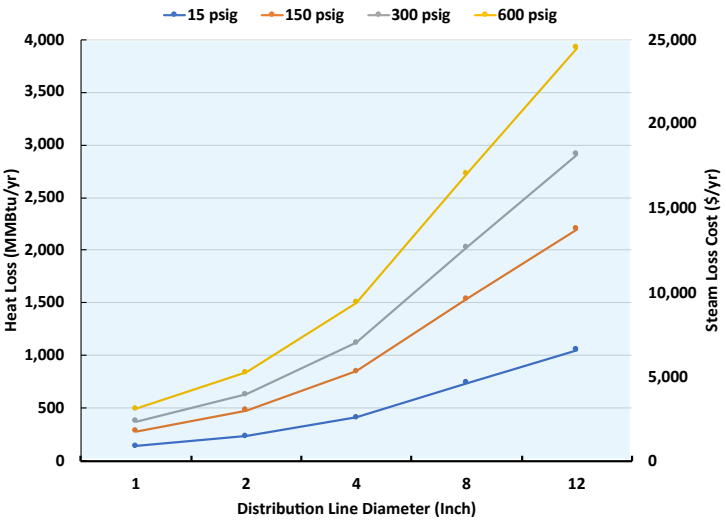
Leaking Steam Trap Discharge Rate and Cost



**Based on Natural Gas unit rate of $0.5/therm and boiler efficiency of 80%.*

Heat Loss Per 100 Feet of Uninsulated Steam Line



***Based on Natural Gas unit rate of $0.5/therm and boiler efficiency of 80% and 8,760 operating hours per year.*

Resources

1. Steam System Modeler Tool (SSMT) by US DOE
2. Steam System Scoping Tool (SSST) by US DOE
3. Insulation tool - 3EPlus by Insulation Institute
4. Improving Steam System Performance: A Sourcebook for Industry by US DOE
5. Steam System Survey Guide by US DOE
6. Steam Tip Sheets by US DOE