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Steam Performance



There's gold
in your steam
and Union Gas
can help you
find it!

Do you want to lower your steam operating costs? Even a small steam leak can cost you \$4,500* a year

Improving your steam system performance with regular repairs and replacements can pay big returns. Steam trap paybacks are typically measured in months, not years. So even fixing a small steam leak of 1/16 of an inch can pay you back in a couple of months.

You can't afford steam leaks – because they can add up very fast. Not spending \$250 on repairing a steam trap could cost you more than \$4,500 every year. It just doesn't make sense to ignore leaks that hurt your bottom line. Union Gas can show you how to find the gold in your steam.

Telltale signs you are losing dollars

How do I know when my steam system is costing me money? Here are some signs that you are bleeding steam – and money.

- Steam plumes
- Bare pipe and valves
- Damaged insulation
- Leaking pipes and valves
- Leaking water
- Leaking condensate

* 100 psig steam discharging to atmospheric pressure through a 1/8" inch re-entrant orifice with a coefficient of discharge equal to 0.72 for 8,760 hours per year and a steam cost of \$10.00/1000 lb
 – US Department of Energy: Steam Tip Sheet #1 • January 2006

High performance steam systems Regular upkeep, higher returns

Union Gas financial incentives will help pay for, and increase your energy efficiency by keeping your high performance steam system in good working order.

Our incentives will help pay for

- Repairing failed or leaking steam traps
- Repairing leaking steam components: control valves, relief valves, isolation valves and flanges/connections
- Repairing steam leaks in distribution systems
- Repairing condensate leaks in return systems
- Upgrading insulation on piping, valves, fittings and surfaces
- Cleaning heat exchangers or heat exchange surfaces

Repairs and replacements will pay you back handsomely – with higher returns and a better looking bottom line.

The first step in improving your steam system performance

To be eligible for Union Gas financial incentives, we'll be looking for the following customer information to complete your application form. All estimated gas costs based upon \$0.25/m³.

General info requirements

- System operating hours
- Hours per year
- Raised steam pressure – psig
- Steam pressure(s) utilized – psig
- Thermal or system efficiency – %
- Boiler quantity, make, model and fuel input
- Condensate return – %
- Condensate return pressure – psig
- Combustion blower – hp
- Feed water pump – hp
- Load type – process or heating
- Average steam production – lb per hour
 - Winter and summer, if applicable

Specific info requirements

Leaks - Steam Trap & Components

Average Union Gas customer saving – \$2,950 per trap

11,800 m³ saved per trap at an average of \$2,950 per trap

- Quantity repaired – #
- Inlet pressure of trap/valve – psig
- Total trap population – #
- Type of trap/valve repaired – make/model/size
- Operation hours – hours per year
- Estimate of leak orifice diameter – inch
- Method of determining leak:
 - thermal, visual, ultrasonic, other

Example: 2" TD style steam trap with an equivalent leak orifice of 1/8" @ 120-psig / 8,000 hours per year

Leaks – Steam / Condensate

Average Union Gas customer saving – \$19,154 per condensate leak

76,619 m³ saved per condensate leak at an average saving of \$19,154 per condensate leak

- Quantity repaired – #
- Steam pressure at leak – psig
- Was there a visible steam plume – yes/no
 - If yes, estimate of plume height – feet
- Ambient temp. when plume was viewed – °F
- Leak rate of condensate – litres per min or gal per min
- Temperature of leaking condensate – °F
- Operation hours – hours per year
- Type of leaking/repairs component
 - Pipe, flange, connection

Example: 3" diameter steam pipe with a 2' visible steam plume at 50°F at 100-psig / 6,000 hour per year

Insulation – Pipes, Valves, Fittings & Surfaces

Average Union Gas customer saving – \$120 per foot of steam pipe

Steam pipe savings – 480 m³ per foot at an average of \$120 per foot or \$396 per metre

Condensate pipe savings – 75 m³ per foot at an average of \$20 per foot or \$66 per metre

Valves & Fittings savings – 400 m³ per year or \$100 per year for a 3" valve / 2,000 m³ per year or \$500 per year for a 12" valve

- Pipe diameter – inches
- Pipe length – feet
- Surface area insulated – square feet
- Size of valve or fitting insulated – inch
- Surface temperature – °F
- Average temperature of location – °F
- Location – indoors or outdoors
- Orientation – horizontal or vertical
- Operation hours – hours per year
- Type of insulation installed
- Thickness of insulation installed – inch

Example: 100 feet of 6" steam pipe @ 120-psig, insulated with 3" glass fibre insulation with aluminum covering / 6,000 hours per year, indoors

Cleaning – Heat Exchanger & Surfaces

Average Union Gas customer saving – \$8,725 per year

25% heat transfer reduction of 1,000,000 Btu per hour x 4,000 hours per year with 80% efficient system 34,900 m³ per year at an average saving of \$8,725 per year

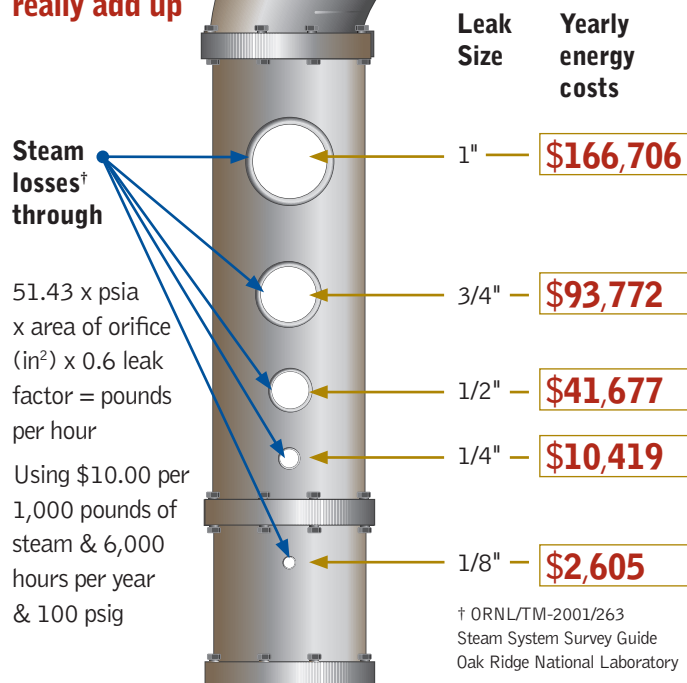
- Type of fouling
 - Scale, sludge, dirt, other
- Cold side inlet and outlet temperature – °F
 - Before and after cleaning
- Flow rate of cold side stream – gpm
- Design heat transfer rate – Btu per hour
- Reduction due to fouling – %

Losses through steam leaks really add up

Steam losses†

51.43 x psia x area of orifice (in²) x 0.6 leak factor = pounds per hour

Using \$10.00 per 1,000 pounds of steam & 6,000 hours per year & 100 psig

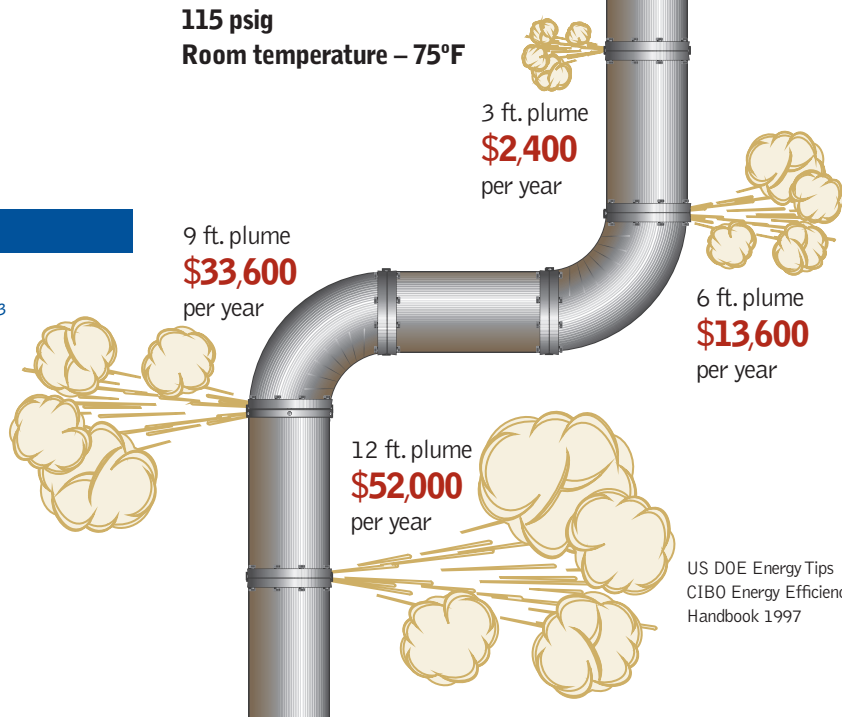


Schedule your annual steam maintenance now – and start saving sooner

Don't leave money on the table. Use Union Gas financial incentives to build a high performance steam system that saves you money.

With steam leaks, size really matters. The magnitude of your steam plume signals the amount of money you are losing

115 psig
Room temperature – 75°F



US DOE Energy Tips
CIBO Energy Efficiency
Handbook 1997



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Steam Performance

Energy efficiency never ends

Energy efficiency is all about continuous improvement. It includes everything from designing new and replacement systems, to making good equipment choices, all the way up to successfully operating the systems and equipment you install through preventative maintenance.

Call the energy experts at Union Gas

Union Gas is committed to helping commercial and industrial customers make energy efficiency part of their business planning. The EnerSmart program offers commercial and industrial customers a full range of support every step of the way. Our team of energy experts can help you find the best solutions for your facility.

The EnerSmart program provides significant incentives for new and retrofitted energy efficient equipment and technologies that yield immediate and ongoing savings on utility costs. If you'd like to learn more about our financial support for high efficiency equipment and studies, visit our website at enersmart.com/largebusiness or contact your Union Gas Account Manager.

Commercial, Institutional and Agricultural Account Managers – uniongas.com/cams

Industrial and Large Commercial Account Managers – uniongas.com/iams



Investigate, Evaluate & Design



Operate & Maintain

Equip & Install

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Energy efficiency projects pay you year after year!