

INTRODUCTION

For many years, steam has been used in industrial and commercial facilities for heating, drying, cleaning and other applications. According to the U.S. Department of Energy, 46% of the energy consumed in the U.S. is used to generate steam for industrial processes. Energy is one of the highest yet most controllable costs of operating any plant. Many facilities can benefit greatly from a carefully monitored steam energy maintenance program. A steam trap survey program can help eliminate steam loss and cut fuel costs. This booklet describes how a steam trap survey can be an essential first step in an on-going steam trap maintenance program.

WHAT IS A STEAM TRAP?

A steam trap is a device attached to the lower portion of a steam filled line or vessel which will pass condensate but not steam. The prime function of a steam trap is to remove condensate from the steam system at the same rate as it is being formed. The trap opens automatically to discharge condensate and closes to prevent steam loss from the system. Unfortunately in many facilities, 30 to 50 percent of the traps are passing live steam as well as condensate. This energy waste is partially due to improperly sized or misapplied steam traps, inadequately trained personnel, and/or the lack of time and manpower to test existing traps.

In addition to removing condensate, the steam trap must also include the following features for overall peak efficiency and economy of operation:

1) Minimal Steam Loss.

The following table shows how costly unattended steam leaks can be. @ 100 PSI

Size of Orifice	Lb. Steam Wasted Per Month	Total Cost Per Month	Total Cost Per Year
1/2"	835,000	\$4,175.00	\$50,100.00
7/16"	637,000	3,185.00	38,220.00
3/8"	470,000	2,350.00	28,200.00
5/16"	325,000	1,625.00	19,500.00
1/4"	210,000	1,050.00	12,600.00
3/16"	117,000	585.00	7,020.00

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2) Long Life and Dependable Service.

Rapid wear of parts quickly brings a trap to the point of undependability. By contrast, an efficient trap saves money by minimizing trap testing, repair, cleaning and downtime.

3) Corrosion Resistance.

Working trap parts should be corrosion-resistant in order to combat the damaging properties of condensate.

4) Air Venting.

Air can be present in steam at any time, as well as on start-up and must be vented for efficient heat transfer.

5) Carbon Dioxide (CO₂) Venting at Steam Temperature.

When CO₂ is vented and condensate discharged at steam temperature, corrosive carbonic acid is unable to form in heat exchanger equipment.

6) Operation Against Back Pressure.

The possibility of back pressure in the return line is always present. A steam trap should be able to operate in the return system.

7) Freedom From Dirt Problems.

Condensate will probably pick up dirt and scale in the piping and there may be a carryover of solids from the boiler. The steam trap must be able to operate in the presence of this dirt or strainers should be installed in the lines immediately before the trap.

A trap that delivers anything less than all the desirable operating and design features listed above will reduce the efficiency of the system and increase costs. A trap that delivers all these features is a major factor in achieving:

1) Fast heat up of heat transfer equipment.

2) Maximum equipment temperature.

3) Maximum equipment capacity.

4) Maximum fuel economy.

5) Reduced labor per unit of output.

6) Minimum maintenance and long trouble-free trap life.

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The following is a checklist developed by the Energy Division of the North Carolina Department of Commerce to evaluate the overall efficiency and economy of operation of steam traps and how the Enercon System will out-perform ANY Mechanical Steam Trap on the market today!

1) MINIMAL STEAM LOSS

The following table shows how costly EACH steam leak can be @ 100 PSIG.

Orifice Size	lbs. steam wasted/month	total cost/month	total cost/year
1/2"	835,000	\$ 4,175.00	\$ 50,100.00
7/16"	637,000	3,185.00	38,220.00
3/8"	470,000	2,350.00	28,200.00
5/16"	325,000	1,625.00	19,500.00
1/4"	210,000	1,050.00	12,600.00
3/16"	117,000	585.00	7,020.00

In the typical facility, 30-50% of steam traps are passing live steam as well as condensate!

The Enercon condensate removal units cannot fail open because they have no moving parts!

2) LONG LIFE AND DEPENDABLE SERVICE.

Enercon units are guaranteed forever!

3) CORROSION RESISTANCE

Enercon units are made from Cold-Rolled 316 Stainless Steel, they do not corrode!

4) AIR VENTING

Since they are always open, Enercon Units never have a problem with air venting.

5) CARBON DIOXIDE (CO₂) VENTING AT STEAM TEMPERATURE

When CO₂ is vented and condensate discharged at steam temperature, corrosive carbonic acid is unable to form in heat exchanger equipment.

Enercon units vent condensate as it is being produced, at the highest temperature possible, along with the CO₂.

"NOT THE ONLY SOLUTIONS...

... JUST THE BEST"

6) OPERATION AGAINST BACK PRESSURE

Enercon units exhaust to atmosphere, or the DESIGN BACK PRESSURE, as required.

7) FREEDOM FROM DIRT PROBLEMS

Enercon units have no mechanisms to be bound up by dirt and are sold with the appropriate up-stream strainer to keep the unit from plugging.

A trap that delivers anything less than all the desirable operating and design features listed above will reduce the efficiency of the system and increase costs. A trap that does deliver all these features is a major factor in achieving:

- 1) Fast heat up of heat transfer equipment
- 2) Maximum equipment temperature
- 3) maximum equipment capacity
- 4) Maximum fuel economy
- 5) Reduced labor per unit of output
- 6) Minimum maintenance and long trouble-free trap life

Your local Enercon Systems representative is ready to show you how you can minimize your costs and maximize your profits. Give'm a call today!