WHYS AND WHEREFORES OF STEAM TRAPS FOR DRY KILNS

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To begin a discussion on steam traps one should define the function of a steam trap; which is, simply, "to remove condensate and non-condensible gases from the steam heated unit as fast as they accumulate." The difference between a good trap installation and a poor installation, is how efficiently this is done.

To insure you have an efficient trap installation you must:

1. Select the correct type and size trap for your system.
   There are many things to consider in selecting a steam trap.
   a. Efficient operation versus time in service.
   b. Type heat transfer equipment.
   c. System
      1. Load
      2. Type of control
      3. Back pressure
      4. Etc.
2. Install the trap correctly.
   a. Make sure you have gravity drainage from coil to trap.
   b. Make sure return lines are adequately sized (Note: Trap connection sizes have nothing to do with the size of return line.)
3. Maintain the traps.
   All traps are mechanical devices that require maintenance. Some types have longer efficient service life than others; but all types will eventually wear out. It is very important to check the trap operation on a regular time schedule.

How important it is to replace or repair defective traps can be determined by realizing how much a trap blowing through can cost.

Assume: 125# Steam Pressure
0 PSI Back Pressure
Cost of Steam at $3.00/1,000 lbs.
Trap Blowing Through

Orifice Size	Lbs. Steam Wasted Per Month	Total Cost Per Month	Total Cost Per Year
1/8"	52,000	$ 158	$ 1,890
3/16"	117,000	351	4,212
1/4"	210,000	630	7,560
3/8"	470,000	1,410	16,920
1/2"	835,000	2,505	30,060

Most dry kiln systems require traps that are rated high for the following characteristics.

1. Energy Conservation Time in Service
2. Resistance to Wear.
3. Responsiveness to Slugs of Condensate.
4. Responsiveness to Hydraulic Shock.
5. Operate Against Back Pressure.
6. Performance on Light Loads.

Based on above, we recommend Inverted Bucket Traps with large vents.

The following chart shows how various types of traps meet specific operating requirements.

	CHARACTERISTICS	INVERTED BUCKET	F & T	DISC	BELLOWS THERMOSTATIC	DIFFERENTIAL CONTROLLER
A	Method of Operation	Intermittent	Continuous	Intermittent	(1) Continuous	Continuous
B	Energy Conservation (Time in Service)	Excellent	Good	Poor	Fair	(2) Excellent
C	Resistance to Wear	Excellent	Good	Poor	Fair	Excellent
D	Corrosion Resistance	Excellent	Good	Excellent	Good	Excellent
E	Resistance to Hydraulic Shock	Excellent	Poor	Excellent	Poor	Excellent
F	Vents Air and CO_2 at Steam Temperature	Yes	No	No	No	Yes
G	Ability to Vent Air at Very Low Pressure (1/4 PSIG)	Poor	Excellent	NR(3)	Good	Excellent
H	Ability to Handle Start-Up Loads	Fair	Excellent	Poor	Excellent	Excellent
I	Operation Against Back Pressure	Excellent	Excellent	Poor	Excellent	Excellent
J	Resistance to Damage from Freezing (4)	Good	Poor	Good	Good	Good
K	Ability to Purge System	Excellent	Fair	Excellent	Good	Excellent
L	Performance on Very Light loads	Excellent	Excellent	Poor	Excellent	Excellent
M	Responsiveness to Slugs of Condensate	Immediate	Immediate	Delayed	Delayed	Immediate
N	Ability to Handle Dirt	Excellent	Poor	Poor	Fair	Excellent
O	Comparative Physical Size	Large (5)	Large	Small	Small	Large
P	Ability to Handle "Flash Steam"	Fair	Poor	Poor	Poor	Excellent
Q	Mechanical Failure(Open - Closed)	Open	Closed	(6) Open	(7) Closed	Open

1. Can be intermittent on low load.
2. Excellent when "secondary steam" is utilized.
3. Not recommended for low pressure operations.
4. Cast iron traps not recommended.
5. In welded stainless steel construction - medium.
6. Can fail closed due to dirt.
7. Can fail open due to wear.