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Steam Utilization and Laundry Profits

By Robert F. Steffero

An area that can strip large and small laundries of profit is inefficient steam utilization. Of all the equipment in the laundry the flatwork ironer is one of the largest consumers of steam. Therefore proper steam trapping and removal of accumulated air in ironer chests are key ingredients to achieving maximum efficiency and profits from your laundry operation.

Condensate must not be allowed to collect in the chests of your ironer. Condensate acts as an insulator which will prevent chest surface temperatures from reaching their intended levels. It is thus important to insure proper condensate drainage from the steam space.

Over the years, many methods of steam trapping and types of steam traps have been applied to flatwork ironers. Some believe that master trapping, using a single steam trap for all chests, is as efficient a method as unit trapping, that is utilizing a single steam trap for each chest. Over 30 years of experience in steam engineering has proven to me that optimum ironer performance is achieved only by unit trapping.

With master trapping, condensate and particularly air from one or more of the chests may fail to reach the trap. This is due to the fact that any difference in condensing rates will cause a difference in steam pressure. Even a pressure difference of a fraction of an ounce (undetectable by a standard guage) will permit a backflow of steam from the higher pressure units into the lower pressure units, thereby impeding flow of condensate and almost entirely stopping the flow of air to the steam trap.

The resulting loss of heat transfer to the surface of the ironer chests will reduce the ironer output through less drying capability and negative effects on linen travel. Poor performance by master trapping increases fuel consumption at the boiler end of the steam system while increasing the operating costs of the ironer.

Accumulated air in the ironer chests also prevents the proper heating of the metal surfaces and, therefore, must be removed continuously. Air is an excellent insulator and can drastically hinder the rate of heat recovery during ironer operation. The following table shows the substantial reductions in steam temperature caused by air dilution.

Temperatures of Steam
(at 100.3 lbs. of pressure)
With no air present 338.1 F
With 10% by volume of air 330.3 F
With 20% by volume of air 321.8 F
With 30% by volume of air 312.4 F

The steam trap selected should be capable of removing air at a reasonable rate. However, this does not eliminate the need for a separate air venting circuit.

There are four different types of steam traps: (1) Inverted bucket; (2) Thermostatic; (3) Thermodynamic; and (4) Float and Thermostatic. Generally, it is recommended to select the steam trap that provides the least possibility for failure under normal operating conditions and a steam trap that fails in an open position rather than closed. This is to prevent cooling of the chests during production hours. A failed steam trap should not be allowed to interrupt ironer output.

The reasons for recommending inverted bucket traps versus the other types listed above are:

- (1) The inverted bucket trap has established its reliability in the laundry industry.
- (2) 98% of inverted bucket trap failures occur in an opened position.
- (3) Air holes in the bucket, known as thermal by-passes, vent accumulated air quickly.
- (4) Thermostatic steam traps tend to have a higher failure rate and generally fail in a closed position. The internal thermal components tend to take a set from fatigue causing a partial obstruction to the orifice. The partial obstruction reduces condensate flow resulting in surface cool down.

Specific criteria for steam trap selection is as follows:

- Weight and moisture content of the work,
- Average running speed,
- Operating steam pressure,
- Steam supply in pounds per hour,
- Condensate drainage line sizes,
- Air removal capabilities, and
- Trap failure position

For optimum heating of the ironer under all conditions, follow these recommendations:

- Employ inverted bucket traps with enlarged thermal by-passes.
- The steam trap selected must be sized to handle the start-up load as well as the operating load. Most manufacturers recommend a 2 to 1 safety factor.
- When installing the main steam supply piping to a flatwork ironer it is acceptable to increase the line size. Never decrease. If in doubt, go larger.
- Properly drip the end of the main steam supply 12" above the floor.
- Remove plugs at the end of each chest and install a line from each chest to a common 1" header mounted on the top of the ironer. At the end of the horizontal run install a vertical riser of at least 18". Install a suitable thermostatic air vent that pipes its discharge to the condensate line.
- Build a condensate header and mount all the steam traps on the header. The header should not be less than 3" in diameter.
- All condensate drainage lines should be a minimum of 3/4" inside diameter.
- Connect all the trap inlet lines to the chests with 3/4" inside diameter flexible metal hose of sufficient length to accommodate chest travel. Connect all the trap discharge lines with 3/4" schedule black iron pipe.
- Insulate all exposed piping to prevent heat loss and protect operating personnel.
- Beware of the "Ultimate" steam trap. Performance and reliability are what is needed -- not sales gimmicks or lower selling prices.

(Mr. Steffero is an international steam consultant based in the Atlanta office of Vaughn Associates, Inc.)

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Profile...

Nancy Mincello joined Talley Machinery Corporation in February of 1989 as a Sales Coordinator to the company's equipment division. In 1990, her responsibilities expanded to include management of the company's Parts Department. Under her guidance, Talley's Parts Department has expanded to include most parts for older American flatwork ironers, Troy ironers, centrifugal extractors, and washer parts, as well as many custom-made parts. In addition, Talley handles 30 OEM lines. In 1991, Talley Machinery was purchased by Tingue, Brown & Company and, as a result, Nancy was introduced to an even broader base of laundry equipment customers.

Nancy majored in Political Science at Fairfield University in Fairfield, Connecticut. In September of 1993, Nancy became the first woman to graduate from the Maintenance Management Institute (MMI), which is a three year program jointly sponsored by the Textile Rental Services Association of America (TRSA) and the Uniform and Textile Service Association (UTSA). This program is intended for engineers who wish to improve their management and communications skills.

Prior to joining Talley Machinery, Nancy worked for Interim Dewatering

Services, Inc., a hazardous waste management company located in Monroe, Connecticut that specializes in sludge dewatering. Nancy's husband, John, is the Operations Manager of Rocket Express expedited trucking. A lot of Talley customers receive their parts via Rocket Express. Nancy and John have two sons, John, 12, and Michael, 10. The family likes to Rollerblade together and they are all avid basketball fans. In her spare time, Nancy reads and plays golf.

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Ask Tingue, Brown About...

Saving Time

Next to padding your ironer, changing aprons is perhaps the most time-consuming maintenance project involving your flatwork ironer. Since your top apron receives most of the wear because of its constant contact with the underside of the flatwork ironer chest, it is usually the one that needs changing.

Bubba Roberson, Tingue, Brown's newest representative covering most of Alabama and Tennessee, has a tip to save you bundles of time when changing your top apron. Bubba says that he used to employ the following steps when he was a Production Supervisor for National Linen Service in Florence, Alabama.

- Take pressure off the ironer to the point where the aprons are just turning.
- From the rear of the ironer with the ironer stopped, lay your new top apron on your old top apron and then turn the ironer on. Feed the new apron in until it comes to the front of the ironer. Stop the ironer when the new apron has just circled the drive roll.
- Now move to the rear of the ironer again and reach under the new apron and completely cut the old apron at a point near the ironer chest. Be careful not to get close and burn yourself.
- Turn the ironer on again. The new apron will now be running back towards the rear of the ironer and the old apron will be running itself off the rear end of the ironer.
- When the new apron has made the full circle, stop the ironer. The old apron should be easily removed by simply pulling the remaining section out of the ironer. (When you stop the ironer, the trailing edge of the old apron should have made it around the drive roll at the front of the ironer.)
- Pressure on the apron harps can now be screwed down and the new apron easily laced together.

Bubba points out that these steps avoid a lot of connecting and disconnecting with a worn out apron with worn out laces. Now, you simply have to connect the new apron to itself. Bubba says, "Be careful, good luck, and call me if you need help."

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Special Announcements!!

- We've moved!!
As of November 1, 1994, the Illinois office of Tingue, Brown & Co. will be enjoying a new home. Make a note of the following new address:
655 West Grand Avenue Suite 130
Elmhurst, Illinois 60126
- Back By Popular Demand!!
Several years back, Tingue, Brown hosted a series of one-day laundry seminars covering topics as diverse as chemical usage, lubrication, and ironing of polyester linen. Plans are being made for a repeat performance during the Spring of 1995. The industry's best speakers will be on hand for a day of learning that no one should miss. Be on the lookout for further announcements, or ask your local Tingue, Brown representative for more details.
- Speakers Available
Tingue, Brown prides itself on the vast knowledge that it has gathered throughout the years. This knowledge is available for various speaking engagements upon the asking. From production to maintenance, from in-plant to the corporate boardroom, Tingue, Brown can teach, train, and downright amaze you! Just ask, listen, and learn.

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The Corner Collection of Quarterly Quotables

"Don't be afraid to fail. Remember: only the mediocre are at their best all of the time."

"A good way to judge people is by observing how they treat those who can do them absolutely no good."

"You don't have to change; survival is not compulsory."

"Here's a tip for when the boss tells a joke: He who laughs, lasts!"

"A bargain is usually something so reasonable they won't take it back when you find out what's wrong with it."

Send your favorite "Quotable" to: Tingue, Brown & Co., 655 West Grand Avenue, Suite 130, Elmhurst, Illinois, 60126, Attn: David Tingue

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