



Steam ironers are the traditional method for pressing flatwork, and laundries usually have sufficient steam boiler capacity to run them. Steam ironers also typically cost less than thermal oil equipment. However, problems include the prospect of efficiency losses due to flash steam, blow down and de-aerator loss (15%-20%), along with the likelihood of steam corrosion and mineral deposits on piping. These and other factors add to maintenance demands needed to keep costs under control.

Steam, Oil, or Gas-Fired Ironers

— Which Works Best for You?

Sorting out the pros and cons of today's choices in flatwork equipment

By Gerard O'Neill

Each and every laundry operation has a unique set of circumstances that must be analyzed when making a decision on whether to purchase steam, gas or thermal oil ironers (self-contained or central system).

There is no such thing as a “quick fix” or “this one is best” when each has their own merits, shortcomings, etc. Productivity, maintenance, environmental issues, operating costs, licensed engineers (whether you need one or not?); space allocation and system economics are all factors in the decision-making process. Below we offer a series of high points on all three ironer systems.

Steam Ironers

Steam has been the conventional method for heating ironers for many years. Most operators are familiar and comfortable with this method of heating ironers and making hot water (if needed).

Advantages:

1. Most laundries need or already own/operate a steam boiler.

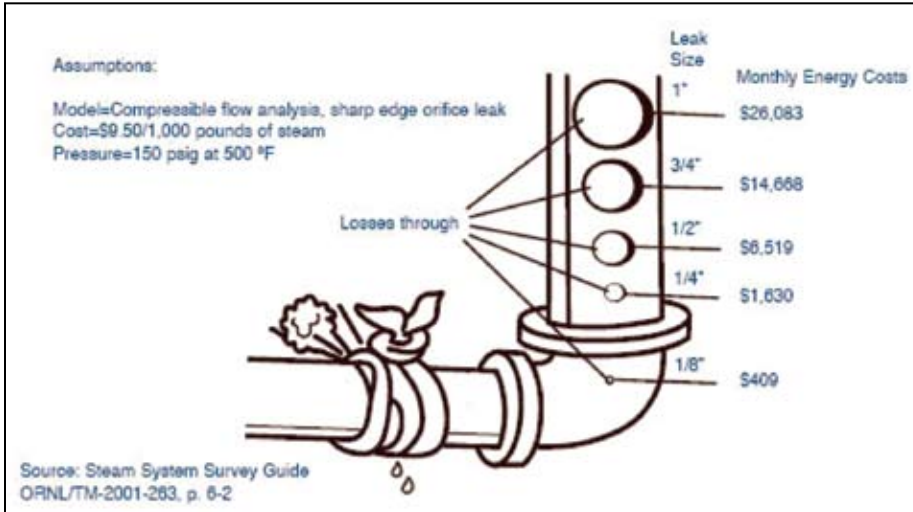
- Steam is used in other areas of the laundry (e.g. steam to wash-room, water heaters/steam bundles, steam tunnel, presses, etc.).
- Gas- or oil-fired boilers (dual fired boilers) have the advantage of being able to switch from gas to oil, depending on costs/market conditions!

Flatwork Options

- Typically the cost of a steam ironer is LESS when compared to “thermal ironers” vs. “steam ironers.”

Disadvantages:

- Efficiency:** Flash loss, trap loss, blow down loss and de-aerator loss (15%-20%). This excludes the inherent loss of efficiency with Steam boilers (80% efficient out of the box/85% efficient with built in economizers).



The chart above tracks the potential costs of leaky pipes that emit steam you need for your ironers. Operators who ignore these problems are placing the profitability of their operations at serious risk.

Table CG-3. Cost of Various Sized Steam Leaks at 100 psi
 (Assuming steam costs \$5.00/1,000 lbs)

Size of Orifice (in)	Lbs 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
1/8	52,500	262.50	3,150.00

The steam loss values assume clean, dry steam flowing through a sharp-edged orifice to atmospheric pressure with no condensate present. Condensate would normally reduce these losses due to the flashing effect when a pressure drop is experienced.

The chart above details the costs of steam leaks in terms of volume and costs on a monthly and annual basis.

- Corrosion:** Steam systems are well known for corrosion problems. Air in combination with hot water, salts, and other contaminants have the potential for metal corrosion. Steam, as a rule, is abrasive and will wear and tear on pipe, fittings, valves, etc. Add scale and other mineral deposits from water supplies gathering internally on piping and equipment and a problem can occur!
- Maintenance:** Steam systems require substantial maintenance focusing on steam traps, steam feed and condensate piping, condensate pumps, expansion joints, water analysis and treatment. (Steam/water lines can also freeze if power fails during a bad cold snap).

- Environmental:** Water in a steam system must be chemically treated (to reduce corrosion). These chemicals cannot be discharged into the sewer system and are considered hazardous materials. In addition, local laws often regulate the temperature of the water/blow down. Special provisions for cooling are required if water/blow down is drained to the sewer system. (Most municipalities will not allow a discharge of over 140°F)

- Safety:** To deliver the temperatures needed at the various ironing lines, the boiler must operate at high pressure (this in and of itself can be a safety factor when operating equipment, especially if correctly maintained equipment is in question).

- Temperature Control:** Steam temperature is directly related to steam pressure. As systems age or are badly maintained, it is common to see a 10°-15°F swing from gauge to gauge, pressure regulators, etc. This doesn't sound like much, but can be the difference in burning a load of goods or ruining them in a jam!

Steam Ironers

Operations:

- Steam Pressure:** Typically steam boilers are rated for 150 PSI (max) with operating pressure 125-140 PSI (any higher and pressure relief valves will blow!).

- Steam Temperature:** Typical (older) ironing systems (e.g. Hypros and Super Sylons) operate very well with 125 PSI (352.5°F) at the ironer. Newer more modern steam ironers (especially large roll models) operate well at 135 PSI (358°F) (distance from boiler and size of steam header are **MAJOR** factors when determining optimum operating pressure/temperature needed at the ironer). Any less and you will be limited in the operating speed of the ironing system and run the risk of wet or badly finished goods leaving the ironer or jamming!

- Licensed Operators:** Many parts of the country require that full time licensed stationary engineers supervise the operation of high-pressure steam systems. The annual typical cost of an engineer is \$60,000-\$75,000 (with fringes and benefits add \$25K). However in some states/cities the stationary engineer does not have to be in the boiler room every second and so he can also be a “maintenance mechanic.”

- Steam Traps:** Often overlooked, steam traps are an integral part of a steam ironer. Traps are used to remove condensate from the chest, which keeps the chest hot. Broken, jammed or badly operating steam traps will not remove water or maintain pressure, causing the chest to cool.

Each chest should be trapped individually (close to the chest!)



Thermal oil ironing eliminates the inefficiencies of steam leaks with a closed system. The thermal oil also protects against corrosion and thermal oil machines start up easily. Downsides include the fact that every 2-3 years operators must replace the thermal oil these systems use.

for the best results.

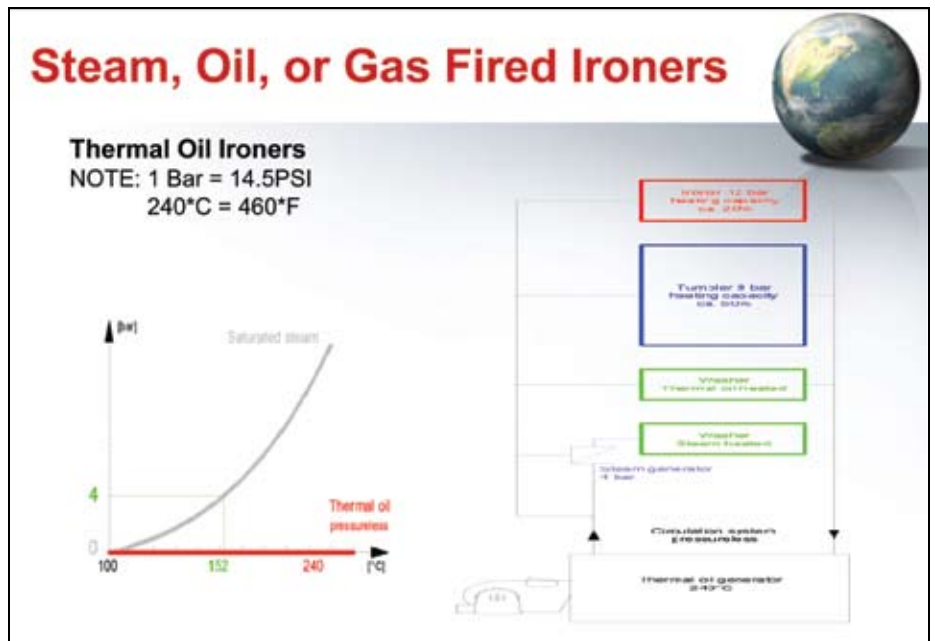
5. Cleaning and Waxing: Many ironer “rejects” are a direct result of improper cleaning. Typically, the start of the shift is a good time to clean and lubricate the ironer every 2-3 hours during the day. Make sure to turn off the blower motors during waxing/lubricating.

Thermal Oil Ironers

Central System

Advantages:

- Capable of replacing steam in a broad application. Not only at your ironers but your washers, dryers, water heaters, etc. It can even be used to create steam if needed for presses, etc.
- Laundries heated with thermal oil (building heat can also be supplied by thermal oil).
- Efficient heating of dryers and ironers (no losses due to steam use).
- Best conditions for the ironer to process the different textiles: operating temperatures between 300°-400° F with an injection regulation (easily and accurately regulated +/- 1-2° F).
- Washing machines could be connected directly to the thermal oil installation.



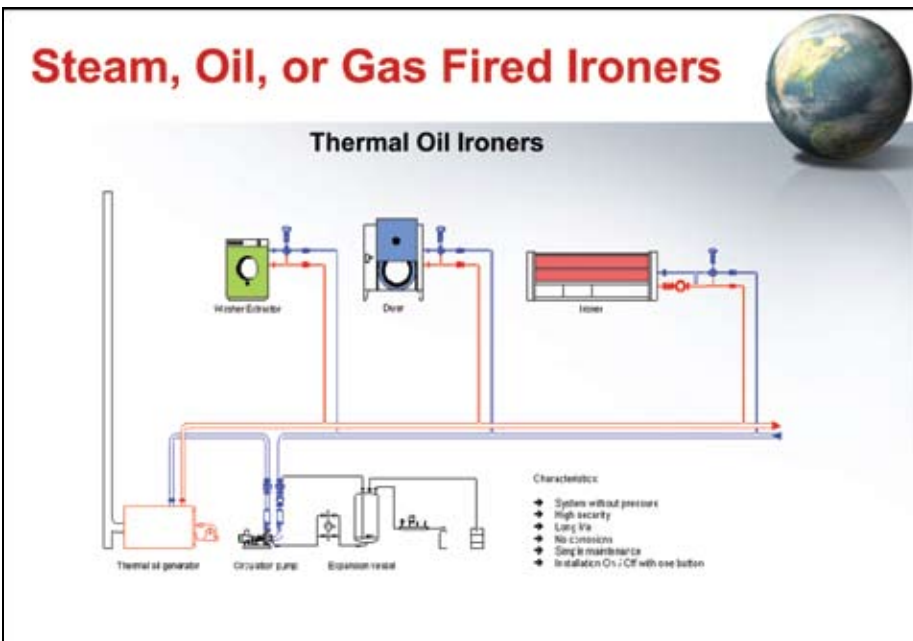
The chart above shows that thermal oil ironers operate without pressure and at higher temperatures than steam. Thermal oil also can be used to create heat or even steam for other equipment, such as washers.

- Washing machines could also be connected with a steam generator of only 60 PSI without any condensate recycling.
- Ease of starting by pushing the button; also easy after long breaks because the thermal oil system stays filled with the thermal oil, which protects the whole installation against corrosion.

Flatwork Options



Gas-powered ironers are often smaller, one- or two-roll machines that make sense if floor space or boiler capacity is an issue. They also can run independently from other laundry machinery in the plant and are relatively easy to hook up and operate.



The schematic drawing above shows a washfloor with a thermal oil generator that produces heat without steam.

Advantages of thermal oil heating plants compared to high pressure steam heating plants.

- Simple installations and placements.
- 30-40% less investment costs (when compared to steam system).

- No corrossions and less maintenance costs.
- Higher efficiency of the heating plant.
- Pressure less system (actually 15 PSI – 40 PSI).
- High security and a longer life (as a system).

Disadvantages:

- 4,000-5,000 hrs. life span on oil (2-3 years). Oil must be replaced and this cost must be accounted for!

Thermal Oil Ironers

Self-Contained System

Advantages:

- Optional Low NOX burners available on some models, which minimizes the release of impurities into the environment.
- All parts, including circulation system are accessible through side panels.
- Some units are shipped with oil (essentially plug and play).

- Some units also have individual burners so each chest can be regulated independently.
- Some units are also designed for easy addition of rolls (future expansion).
- No need to purchase a boiler for these units (if boiler is not

required for other equipment in the facility).

- Eliminates the need to install and maintain steam pipes, fittings, traps, etc.
- 30% less energy consumption than steam ironers
- Higher production output than equally sized steam-heated ironers
- Short start up times (20 minutes approximately) (no boiler start up)
- Ideal for facilities needing a new ironer and not having the capacity with their existing steam system
- Ideal for facilities that wish to operate the ironing department (or individual ironer) without the need to start up the boiler/steam system

Self-Contained System

Disadvantages:

- 4,000-5,000 hrs. life span on oil! (2-3 years) Oil must be replaced and this cost must be accounted for!
- Variations in the cost of gas... (NO CONTROL OVER THIS!)

Direct-Fired Gas System

Advantages:

- Size: Usually much smaller unit (1-2 rolls) and takes up very little room/space in a crowded facility (typical for small hotels/motels/inns, party rental and small hospital OPLs)
- No need for boiler (steam generation)
- Can be run independently of other laundry equipment
- Some models offer chrome-plated heated cylinder, thereby eliminating the need for wax
- Easy hook up (plug and play)
- Some models of this size are also available with “electrical” power ONLY! This eliminates the need for gas lines, permits, etc.
- Newer models have modulating gas burners, thereby increasing the efficiency of the machine. This system reacts more quickly and precisely to changes in the ironing temperature, so gas consumption is lower.

Disadvantages:

Variations in the cost of Gas... (NO CONTROL OVER THIS!).

Tricks of the trade (applicable to most of the above ironer types)

1. **Keep your ironer clean:** Make sure that the chests are a shiny silver color. Any other color will translate into dirty linen and hang-ups in the ironer.
2. **Lubrication:** Most operators either lubricate too much or not enough. The experts say, “**lubricate often, but sparingly**” (Paul Roche/Tingue, Brown and Co.). Every 2-3 hours is good and only add lubricant to your cloth if it is limp and cold. If cloth is hard then do not add lubrication.
3. **pH=Neutral:** Somewhere between 6-7. A lower pH causes the

linen to roll up and squeal.

4. **Monitor speed vs. feed rate:** Coordination between the ironer speed with the items that are fed is critical. Small pieces, e.g., napkins at 30 feet/minute does not translate into the same speed for large pipes/sheets.
5. **Conditioning vs. chest temperature:** Remember that the lower the temperature at the chest, means the less moisture retention in the goods. **Wet linen will jam in an ironer if the temperature is 270° F or lower.** The hotter the chest, the wetter the linen can be.
6. **Roll Size:** Regularly measure the circumference of your roller. When roll size drops below the manufacturer's minimums, then you stand to lose as much as **50% of pressing capability.**
7. **Monitor Linear Speed:** Linear speed increases (each roll turning a little faster than the previous one as the linen goes through the ironer) is necessary on ALL ironers. Most of the older ironers are built with the rolls turning at the same speed, so increased speed is accomplished by increasing the thickness of the padding on successive rolls. Linear speed is critical in ironing polyester linen. If linen is buckling, then check the padding thickness or speed of rolls.
8. **Rolls should be square to the ironer chest:** When bearing blocks wear out, an ironer can get out of level. When this happens, the rolls may not be entirely parallel or square to the chest. This can cause problems in feeding. If the rolls aren't square, linen will buckle and bunch up.
9. **Check the feed board:** A feeding board can warp over time, which can cause an uneven pull on the linen and result in linen with dog-ears or with a trailing edge that rolls up. To test the board, remove the finger roll and see if the problem goes away. If it does, then you need to replace the feed board.
10. **Check the finger roll:** A finger roll is supposed to be round, but with wear and tear it can become chipped or split in the middle. If it is not perfectly smooth it can cause linen to buckle or bunch up. **Also check the placement of the roll.** Many operators like to position the finger roll back toward the safety to provide more room for feeding cotton linen. However, if the plant is running polyester linen, it is best to place the finger roll toward the front of the feed board. Polyester linen does not require the same space to feed it through the ironer.
11. **Excessive chemicals in wash formulas:** Avoid using excessive chemicals in wash formulas. Although a load may test with a pH of 7, it may contain excessive chemicals that will evaporate when the linen is run through the ironer. The chemicals then attach themselves to the chest and leave deposits behind on linen or cause the linen to buckle on the leading edges. **TR**



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