

Laundromat saves with hot water recycler

By REBECCA BROWN
COURIER STAFF

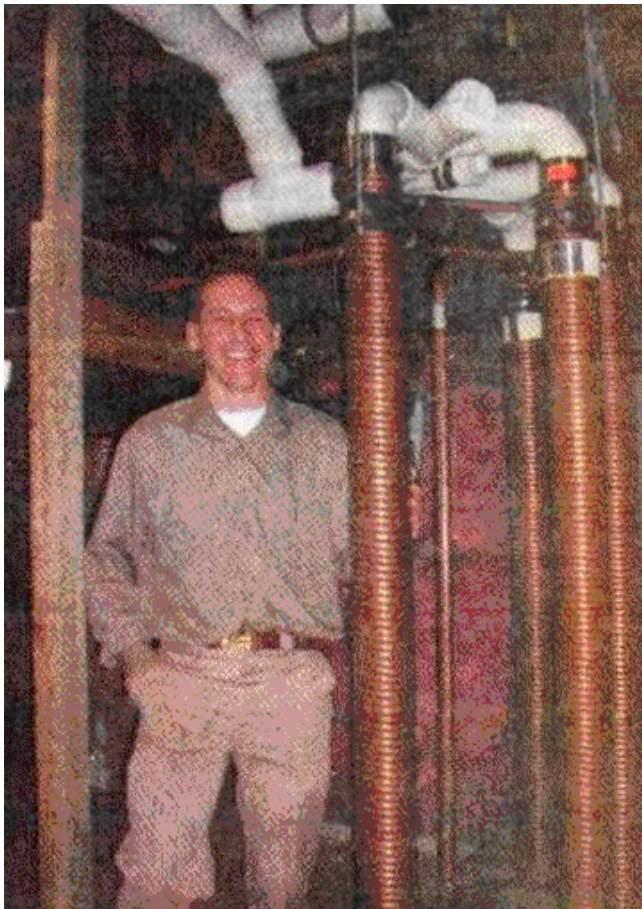
LITTLETON—To Ed Zuk, saving hot water is like putting money in the bank.

His Littleton Easy Wash on Pleasant Street is the first laundromat in the United States to take hot water that normally goes

down the drain and use it to heat water for the next user.

By using a heat exchanger, Zuk is saving over \$1,200 a year in propane costs. In an industry with a slim profit margin, every bit of savings helps, he said. He figures the system

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EASY SMILE--Laundromat owner Ed Zuk shows his pioneering heat exchanger.

Photo by Rebecca Brown, Littleton Courier, Littleton New Hampshire, December 29, 2000

Littleton Easy Wash

(Continued from One A)

will pay for itself in less than two years, especially with the price of propane increasing.

He also advocates the system to homeowners, who can use one like it to lessen energy use and save on their own heating bills.

Zuk bought his father-in-law's laundromat two years ago. Like any new businessowner, he wanted to cut costs and raise productivity. One of the first things

that struck him was how much hot water went down the drain.

Like other coin-operated laundries, Littleton Easy Wash uses thousands of gallons of hot water every week, and thousands of gallons of propane a year.

Zuk wondered how he could recapture some of the energy that went into heating all that water.

A builder friend told him about a drain water heat recovery system. The product is called GFX, or Gravity Film Xchanger. It was developed by a Long Island physicist under a Department of Energy conservation grant.

In June 1999, Zuk purchased the components and built the system himself in the laundromat basement.

The heat exchanging device is, as Zuk says, quite simple. It consists of four copper drain pipes that are wrapped with copper tubing. After running through a lint remover, hot water drained from the washing machines flows through the four main pipes. Incoming cold water flows through

the coiled copper pipes. Heat from the drain water is transferred to the new water, which then feeds into a water storage tank.

When the regular water heater calls for hot water, the incoming water is already heated to within 20 degrees or so of the desired temperature.

Zuk estimates business is up 17 percent since installing the GFX system, but his propane cost is only up three percent. That's

taking into account that propane itself is up about 58 percent over his cost a year ago --- another reason he figures GFX was a good investment.

When Zuk installed the GFX system, he learned from its inventor that he was the first laundromat owner in the country to do so. Builders and remodelers, meanwhile, have started using the system in new homes and businesses that demand a lot of hot water.

"The laundry business isn't too creative," Zuk observed. "They like to keep things simple. But this is simple."

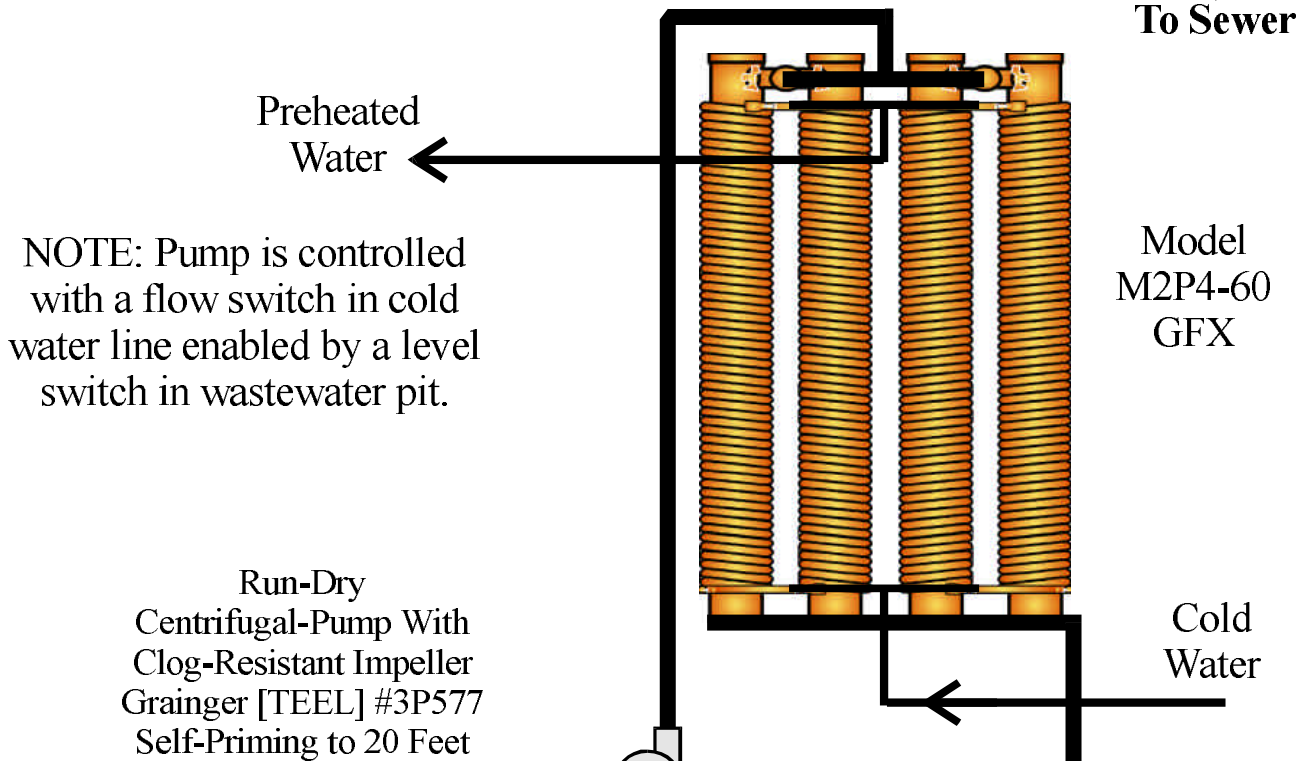
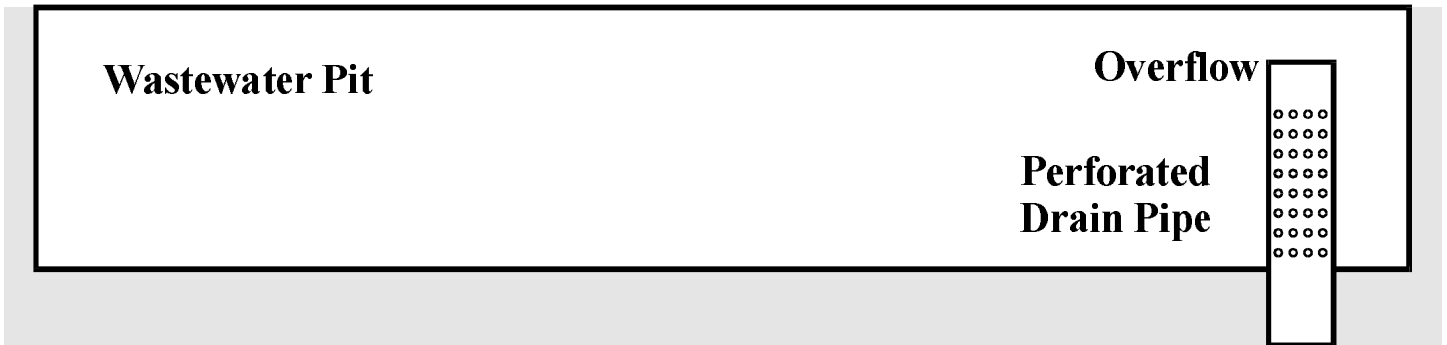
A laundry trade magazine featured the Littleton Easy Wash system last January. Zuk got a few calls from other laundry owners after that, and now, he's learned that a growing number of laundromats across the country are adopting the system.

But Zuk isn't satisfied. Next, he wants to try and capture the heat that's used in the dryers.

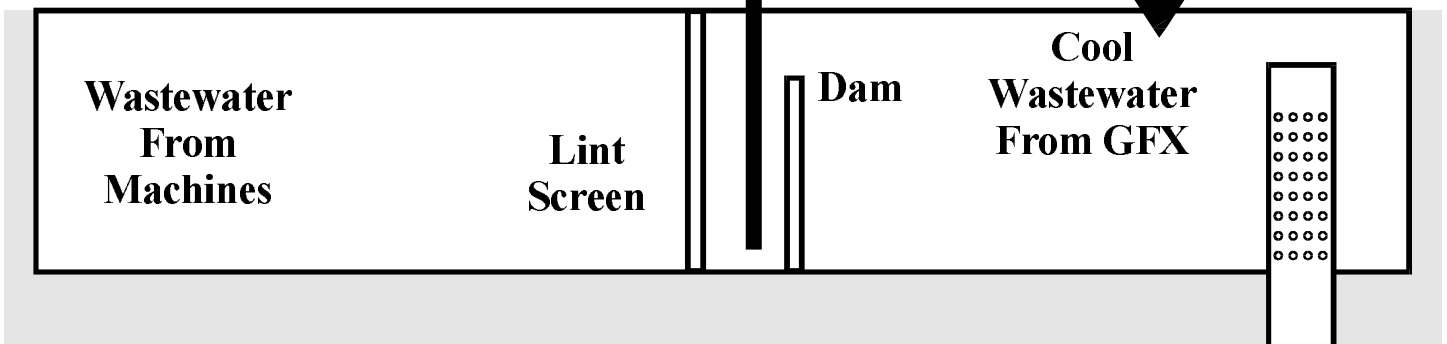
"That's a lot of heat just going outside," he said.

Simple GFX Installation For Coin-Op Laundry

Before



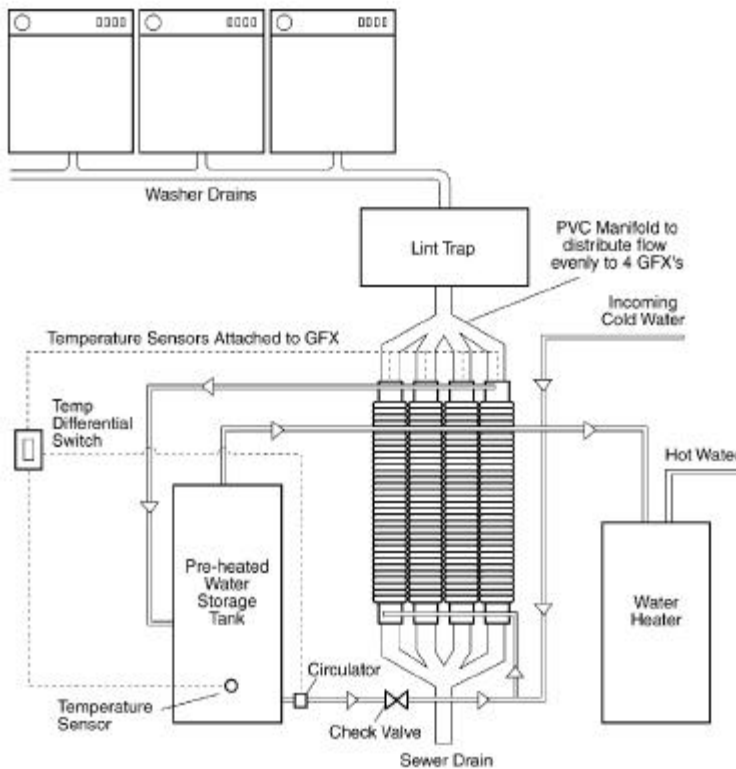
After



American Drycleaner Article (by Doucette Industries)

New Product Helps Laundromats Save Big!

In recent years, there has been a growing interest in technologies that recover heat and recycle it for cost effective energy and money savings. In large laundry facilities such as institutional and commercial operations, owners have discovered and implemented heat exchange systems such as shell and tube units for this purpose. However, the high cost of such heat transfer systems along with their significant bulk has put the benefits of heat recovery out of reach for a great deal of smaller dry cleaners and coin-op laundry operations. But now there are alternatives that can be easily placed into operation that are cost effective and offer considerable energy savings.



One new product making news in the laundry market is the GFX drainwater recovery system. This remarkable new type of heat exchanger economically recovers tremendous amounts of heat from hot water that goes down the drain. Recently developed by a physicist funded by a Department of Energy Grant, the GFX (Gravity Film Xchanger) provides substantial energy and money savings anywhere hot water is consistently used. The GFX is inexpensive, takes up a very limited amount of space, and it offers considerable financial benefits in coin-op laundry, commercial laundry, and dry-cleaning operations.

When you consider that approximately 80% to 90% of all hot water energy goes down the drain and is wasted after it is heated and used once, it makes sense to recover even a portion of the available energy. The GFX has shown that it can recover as much as 85% of that energy, and recycle it back to preheat the incoming cold water entering a water heater.

The GFX unit has also been independently tested by companies like Virginia Power and Pennsylvania Power

and Light who have concluded "The GFX drain water recycling unit is an extremely effective heat exchanger. Its measured effectiveness (recycling efficiency) was very close to that specified by the manufacturer..."

The GFX is a relatively new product and does not have years of trial testing savings in commercial laundry applications for accurate figures on energy savings. However, the product has been extensively marketed to the residential homeowners and contractors for use in houses with low capacity hot water systems. These are houses that quite frequently run out of hot water after consecutive showers because of small or inadequate water heating systems. The GFX is also installed to reduce the energy costs of homes that utilize expensive electric energy to heat their hot water.

In addition, the GFX has also appeared on Bob Villa's "Home Again" television show where a unit was installed in a Habitat for Humanity low income home. In these instances, the contractor can install smaller water heating units while maintaining the same usable hot water capacity resulting in a lower purchase price.

The benefits of the GFX lie in the fact that a hot water heater does not have to use as much energy to raise the level of the pre-heated water to the temperature required. Hence, the more hot water you use, the more energy you save and the greater your overall benefits.

Commercial coin-ops quite often have irregular demand for hot water so they may need to have a ready supply to match demand. A heat exchanger like the GFX can improve the recovery rate of existing water heating systems, reducing the load on the existing system or eliminating the need for a larger water heater. Commercial laundries, on the other hand, can decrease the time between wash cycles, improving productivity by reducing the reheat time of water heating systems.

How It Works

The GFX is a simple device that utilizes proven heat transfer properties to be effective. As hot waste water falls down a vertical section of drain pipe, it clings to the inner surface in a very thin film, taking the path of least resistance around the air inside. The heat from this film is efficiently transferred to incoming cold water circulating through the GFX via an independent circuit around the outside of the drain pipe. Incoming cold water, running in counter flow with the waste water, is pre-heated before it enters the water heater. In that way, the water heater does not have to expend as much energy to raise the temperature of the pre-heated water to the desired temperature and energy savings are realized.

The volume of hot water your water heater can deliver within a given period of time also increases because your water heater does not have to work as hard. In fact, a GFX drainwater recovery system can as much as triple the capacity of an existing electric water heating system. Consequently, the unit actually has the potential to enhance the productivity of a laundromat, making it ideal for those owners who might be entertaining the idea of expansion.

The GFX is completely passive, having no moving parts or heating elements so there's nothing to wear out, and the self-cleaning design assures maintenance-free operation. It has no internal welds either, so you don't have to worry about leakage concerns like those associated with shell and tube systems. It installs easily in place of an existing drain pipe, and simpler installations can even be done by those with little or no prior experience.

Applicable to the Commercial Laundry and Dry Cleaning Industry

In small to mid-size laundries where no heat recovery system is installed, the GFX can easily prove to be a valuable asset. The unit is inexpensive to purchase and install, although, depending on the installation, more extensive modifications may be needed. Typically more than one GFX unit is required for a commercial application. Multiple units are needed to handle the higher quantities of waste water at any given time. The units are manifolded together to handle the drainwater capacity.

The results are the same as a residential system in that the unit will recover up to 85% of the available heat that typically runs down the drain.

Environmental Benefits

In addition to the tremendous financial savings the GFX provides, it also offers significant environmental benefits through its energy conserving operation. The U.S. Department of Energy estimates that heat energy equivalent to 2 billion gallons of oil could be recovered every year from residential sink and shower drainwater alone. Factor in other U.S. plumbing systems, like those found in commercial laundries, and that number rises to over 7 billion. And if just 6 million electric water heating systems were enhanced by the GFX, carbon dioxide emissions would drop by more than 20 million tons per year, according to the U.S. EPA.

Littleton Easy Wash Case Study

The following case study of an actual GFX installation demonstrates its tremendous money and energy saving benefits.

The Problem: Ed Zuk, owner of Littleton Easy Wash in Littleton, New Hampshire, decided he would like to expand the size of his laundromat operation. Under normal circumstances, that would require the purchase of a second water heater to handle the increased need for hot water. But Ed had another idea, having received rumors about a new money saving technology called the GFX drainwater recovery system.

"I heard about the GFX's from a friend who installed a pair in his apartment house," said Zuk. "I figured that if the GFX's could preheat water to my existing water heater, I might be able to avoid purchasing another water heater. I've also always had a strong environmental commitment, so the idea of capturing waste energy was also very appealing to me."

The Installation: Being that there are many different basement and plumbing system configurations, every commercial GFX installation will be unique in some way. Ed Zuk made use of a storage tank and circulators from an old “re-cycoil” system that stole heat from the dryers in his laundromat for his installation.

“I had a lint trap and a full basement which would allow gravity flow of waste water through the GFX’s,” explained Zuk. “I built a carrier for the lint trap so it was near the basement ceiling, plumbed the drains from the washers to it, and made a manifold out of PVC pipe to distribute the wastewater flow evenly to the 4 GFX’s.” Heated laundry wastewater flows into the 80 gallon lint trap and from there it is filtered into the 4 GFX’s for recovery of free heat, or waste heat as it is commonly called.

Carmine Vasile, the physicist who patented the GFX system, suggested Ed run all of the supply water, both hot and cold, through the GFX’s and use no storage tank for pre-heated water. “I figured though, that water use in my laundromat is intermittent, and all washers rinse cold, so the chance of drawing hot water at the exact time that hot water was being dumped would be slim, except on the very busiest days,” Zuk said. “I already had the storage tank and circulator fit into the plumbing system, so I attached them to the GFX’s, and added a temperature differential switch.”

The storage tank holds the incoming cold water that has been pre-heated by the GFX’s until it is ready for use. A temperature differential switch turns the circulator on when the temperature of the GFX is 8 degrees warmer than the bottom of the pre-heated water storage tank. Whenever hot water is drawn off, a check valve forces the incoming cold water through the GFX to scavenge whatever heat is available. Pre-heated water stratifies in the storage tank, the warmest water comes off the top and becomes the incoming cold water for the water heater.

Parts for the GFX system Ed installed were just over \$2,000, and of course, he already had the lint trap, the storage tank, and the circulators. As far as any labor costs involved with the installation, Ed had two brothers, both plumbers who helped him out at no charge. “I would guess that if someone had a system like this designed and installed it would cost from \$4,000 to \$6,000,” remarked Zuk.

Ed explained that his installation was probably more difficult than most because he had to fit everything into his existing plumbing configuration. “I couldn’t see the installation being much of a problem if you were to start from scratch though,” he said.

The Payoff: Ed realized substantial energy and money savings through his GFX systems. He installed the units in June of 1999 along with some additional, new washers and dryers. “It is difficult to figure out exactly how much the GFX’s are saving,” said Zuk. “But compared to the two months before the GFX’s were installed, my business is up 17% overall. My total propane usage, however, is up only a measly 3%.”

Ed calculated he is realizing a 14% savings on his overall propane usage. Because he uses propane for both water heating and drying though, he figures he is actually saving a considerably higher percentage of propane based on his water heating alone. Ed also noted that his increased business has put propane usage for his dryers up 13.5%. His savings to this point have also been based on summer usage conditions, and much more energy is needed to heat water in the winter, especially where he lives in northern New Hampshire. So, with all factors taken into consideration, his actual propane energy usage for water heating alone has dropped substantially.

“I’m saving around \$75.00 currently on my propane bill by using the GFX drainwater recovery system to capture waste heat from 10,000 cubic feet of water each month,” Ed remarked. He estimated the units will pay for themselves in two years or less and recommends the GFX units for the energy and money savings they can provide to other laundromat owners like himself.