

U.S. DOE FUNDED FIELD TEST OF DHR SYSTEM Case Study: Hair Salon, Sayville, NY

Salon Parameters

Open 5 days/week, closed Sunday & Monday; 10 Hairdressers, 3 hairwashing sinks -- increased to 5 after GFX eliminated frequent shortages of hot water on busy days when usage exceeded 1000 gallons; Average & peak usage were 750 & 1500 gallons/day; Natural gas & water sub-metered by owner; Salon located on second floor above clothing store; Sales limited because small utility room could not accommodate another 85 gallon Bradford-White commercial gas water heater; GFX could not be installed on first floor; Hair-washing temperature 105°F @ 3.5 gpm.

Test Periods

Baseline Data: Monday June 8, 1992 to Saturday June 21, 1992
City Water & Gas Used: 7,740 gal & 4,300 cu-ft
Tcold= 62°F
Gas/Water Ratio: 0.556 cu-ft/gal
Corresponding Seasonal Variations Without DHR: 0.694 Average,
0.555 Summer, 0.832 Winter cu-ft/gal @ Tcold = 55°, 65°, 45°F

Measured Performance

June 21, 1992 to December 4, 1992
City Water & Gas Used: 84,830 gal & 39,100 cu-ft
Gas/Water Ratio: 0.461 cu-ft/gal
Average Savings: $[0.694-0.461]/0.694 = 33.6\%$
June 21, 1992 to January 20, 1994
Total City Water & Gas Used: 301,290 gal & 151,000 cu-ft
Gas/Water Ratio: 0.515 cu-ft/gal
Average Savings: $[0.694-0.515]/0.694 = 25.8\%$

NOTE: Shop manager failed to advise of plan to lease back room and add two sinks. This caused DHR system to become undersized 6 months after field test began. Automatic drainwater bypassing of GFX therefore reduced savings.

DHR System Parameters

Hartell Model LTP-L, Laundry Tray Pump sized for 3 sinks having 3.5 gpm sprayers; One P3-60 prototype installed with PVC manifold; Shop manager had previously removed all filters from sinks, so a Grainger, Teal Model 1P999 Basket Strainer had to be installed to protect the pump; Strainer was emptied every few weeks. (Daily cleaning was not necessary because hair floats.)

Lessons Learned

1. GFX eliminated need for second commercial gas water heater & boosted productivity ---- by saving energy;
2. Should have installed a self-priming, run-dry pump near GFX;
3. Should have controlled pump with a flow switch in water heater inlet to minimize automatic-bypassing on busy days;
4. Chemicals used for nail finishing did not foul GFX;
5. Shampoo kept GFX clean;
6. No maintenance or filter would have been required had hair filters been installed as required plumbing codes;
7. Preheat all incoming cold water and provide a separate line for drinking because pre-heated water hit 100°F at times;
8. Larger energy savings would have been realized had the Salon manager also installed a tankless water heater because GFX could not reduce stack/standby-Loss of the tank-type water heater.



***GFX Model P3-60
Prototype Shown
Mounted On Utility
Room Wall In N.Y.
Hair Salon***