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Quote of the Month:

“Excellence is to do a common thing in an uncommon way.”

-Booker T. Washington

? Ask Dr. Brush



Contributed by:
Max Carthew
C.E.O.

Getting Something for Nothing?

When you tell an engineer that his process can give him more out than he puts in he usually looks pretty skeptical and wonders which Pub you just came from. Well we came across a case where it appears that this is exactly what is happening. A customer in the Chemical Manufacturing Industry is feeding a rich solvent fume stream into a gas fired incinerator which has a waste heat recovery boiler. The steam supply from the waste heat boiler helps carry some of the load on a main gas fired boiler.

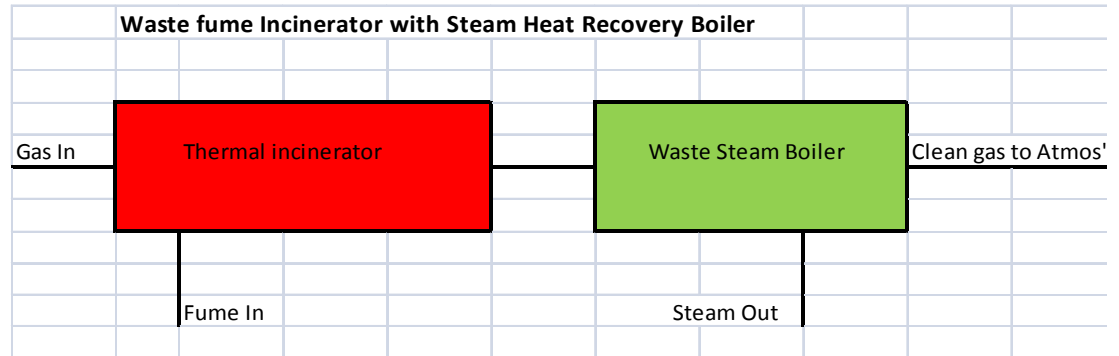
When we did the heat balance we came up with the following data:

Incinerator capacity 5,000 SCFM at 100 DegF inlet and 1,500 DegF outlet temperature.

The incinerator burner heat required is 8,000,000 BTU/Hr.

The solvent fume heat release in the incinerator is 200 Lb/Hr or 3,600,000 Btu/hr.

The incinerator gas burner therefore runs at 8 MM Btu/hr minus 3.6 MM Btu/hr or **4.4 MM Btu/hr**



Boiler capacity 5,000 SCFM at 1,500 DegF inlet and 350 DegF outlet temperature.

The amount of steam generated works out to 6,600,000 Btu/hr at 125 PSI. Allowing for 5% system losses we get a net heat out of **6,270,000 Btu/hr**.

So we have a situation where gas heat in equals 4,400,000 Btu/hr while steam heat out equals 6,270,000 Btu/hr, a theoretical efficiency of 142 Percent from the fuel burnt! A pretty good boiler efficiency. Of course this comes about because of the “free” heat release from the waste fume stream but it really had us scratching our heads for a while.

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WINTER GAS BILL BLUES

As winter comes to an end, do you find yourself wondering why the furnace seemed to be running 24 hours a day, 7 days a week? Or why it is costing \$200 a month to keep the house warm? There are a number of small tasks that can be completed to greatly reduce your energy costs.

To give you an example of typical winter heating costs, a typical 2,000 ft² house in Michigan will have a furnace sized for 100,000 BTUs and delivers approximately 1,500 CFM of airflow throughout the house. The average Annual Fuel Utilization Efficiency (A.F.U.E.), written on the furnace by the manufacturer, is 80%. Assuming the furnace follows this 80% efficiency standard; it will output 80,000 BTU into the airstream flowing through it. Average gas cost given by the utility provider is \$8.00 MMBTU. Running this size of furnace would cost about \$0.64/Hr. If the furnace ran continuously over a 24 hour time period, it would cost almost \$15 per day! From November to February, there are 120 potential heating days. If the furnace ran 24 hrs / day over those 4 months, it would cost approximately \$1,500 to heat your house! Granted, this is unrealistic since most thermostats are used to control how often the furnace will run, which will more likely be ½ to ¾ of the available hours, amounting to approximately \$200/month in a typical climate year for your utility bill.

Now that there is a decent understanding of the cost to heat your house, here are a few pointers to reduce it:

- Change the air filter on a monthly basis

All of the warm air distributed to the house by the furnace must pass through a single air filter. If this filter has not been changed on a regular basis, it may become clogged, restricting the airflow delivered to the house. This would make the furnace have to work harder and longer to deliver the same amount of heat.

- Check all windows and doors for air leaks

This can be done professionally to optimize the savings, or by the homeowner. A simple way to determine the amount of cold air coming in through the seams of your house is to physically check the doors and windows with your hand. If there are any major leaks, you will be able to feel cold air seeping through the seams. To fix the problem, seams should be sealed by using weather stripping or weather resistant caulk. If you feel a significant draft entering below a door, a rubber seal can be installed to eliminate the gap commonly found there.

- Install a programmable thermostat

A thermostat that can be scheduled to change the house temperature set point on a daily basis is perhaps the most important aid in reducing heat costs. When the home residents are away, the temperature of the house can be greatly reduced. When the residents are returning home, the thermostat can raise the temperature to be comfortable by the time someone enter the home. The temperature can also be reduced at night, when snuggling up in a nice blanket can save a significant amount of money.

Contributed By: Derek Decker – Project Engineer

Current Projects

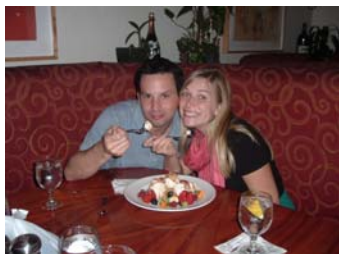
- ❖ During the past quarter Omega has received engineering projects from General Motors, HM White, Duckworth & Associates, Benham Inc, Giffin, and Honda of America. Several of these projects are to do with process improvements, and energy optimization.
- ❖ Omega continues to manufacture the AIRSTAT PDA as well as providing repairs and calibration services for older GILL INSTRUMENTS that have been in service for several years.
- ❖ Ongoing service projects include Siemens/Auto alliance, and ACH Milan Plastics, where Omega is involved in monitoring and verification services.

BRAGGING CORNER

It's A Girl!



Jessica and Jeremy DeMink Carthew are expecting their first baby in late May. Parents Max and Annick were visiting them in Hawaii this winter when they learned that it would be a Girl! Little time passed before she was named Siena.



Celebrations were in order so the couple is seen here enjoying a special treat.



New Home

Derek Decker, a young engineer at OMEGA, recently purchased a foreclosed home with intentions of fixing it up to live in and eventually resell. It has been a long and tedious process, but he is finally ready to move in this weekend!

After months of demolition, cleaning, reconstruction, drywall, paint, tile, carpet and Home Depot trips, the house is in a decent enough stage for occupancy.

The picture below shows the initial garbage pile from the demolition phase of the project!



Oven Design – Energy Reduction Program Update



In the summer 2007 newsletter OMEGA introduced the development of the Oven Design Program. This program will be used to calculate heater load, air volumes and fan operating temperatures for design. The program will also show purge time, air change rate, thermal head, and fresh air volume associated with safe operation of an oven system.

Since the last article, OMEGA has been hard at work to continue the development of the program. The latest update includes a temperature module which predicts the goods and trolley temperatures as the product moves through the zones of the oven. Using this tool, the heater load can be more accurately estimated and it will also show how much of the heat is going to the product. The program will be validated in the next month against real world data for convection zones.

The program will be ready for implementation by OMEGA in the near future. The next phase of the development includes agitation air and radiant zone calculation. With this program, OMEGA will have the ability to process oven systems more efficiently and create a standardized deliverable for their customer.

Contributed By: Tim Moyer – Kettering Co-Op Student



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THIS, TOO, WILL PASS

This, too, will pass. O heart, say it over and over, Out of your deepest sorrow, out of your grief. No hurt can last forever – perhaps tomorrow will bring relief.

This, too, will pass. It will spend itself – its fury will die as the wind dies down with the setting sun; assuaged and calm, you will rest again, forgetting a thing that is done.

Repeat it again and again, O heart, for your comfort; this, too, will pass, as surely as passed before the old forgotten pain, and the other sorrows that once you bore.

As certain as stars at night, or dawn after darkness, inherent as the lift of the blowing grass, whatever your despair or your frustration – this, too, will pass.

-Grace Noll Crowell