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# H.E.L.P. NEWSLETTER

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## LATEST TECHNOLOGY

By David White, National Sales Manager SGI

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The new Electric Immersion element holding furnace utilizes electric elements inside sialon tubes in the middle of the aluminum bath. This produces **lower thermal head temperatures, less metal loss, less oxide growth, less dross, excellent bath temperature uniformity and a casing temperature of less than 118 degrees F. WOW! What more could you ask a holding furnace to do? OH Yeah, how about hold aluminum at temperature (1250 degrees F) for less than 15 BTU's/# with well covers on and less than 22BTU's/# in production.**



Lower thermal head temperatures, less oxide growth, less metal melt loss, less dross and better temperature uniformity! WOW!

They average 2 years life on the elements and over 5 years life on the tubes. You can change the elements on the fly and can stay hot with one element till the other one gets changed. The 2,000# units have 30KW connected and the 9,000# units have 90 KW connected.

Both units as well as the ones in between these have additional power connected in case you need a passing gear. Since these units have full proportional controls you only use what you need to maintain temperature. *When can we build one of these ultra efficient holding furnaces for you?*

## CRUCIBLES VS SMALL REVERBS

Any time you look at adding a machine to the die cast shop that is larger than other machines currently in your facility it presents the age old problem of how to supply molten metal to that machine. Most people just put in the same thing because they are comfortable with that style or brand name or have gotten use to the shortcomings of the furnace and have learned to work around them. Of course the most concrete definition of insanity is to do the same thing over and over again and expect different results. The fact is the only thing constant in life is change. With (according to the Dept. of Energy) the cost of energy set to rise 300% in the next 5 years everyone has to think these decisions over very carefully to make sure you are planning for now and the future. Let's ponder some options.

## ELECTRIC VS GAS CRUCIBLES

Let me start by saying that if you are comfortable using crucible furnaces you really don't know how much they are costing you a year. With maintenance, crucible bowl and element cost (if electric), refractory clean up after a bowl leak, replacing bowls at least once a year, and workers compensation and or safety issue these unit cost far more than their original low up front cost and low hold to melt ratio saves.

Crucibles have their place don't get me wrong! If you have minimum floor space, change alloys often or shut down for long periods of time then crucibles are perfect for your situation. Now your only choice is electric or gas. Gas fired crucible furnaces recover faster than electrics. But electrics reduce noise and heat in the plant (no flue or blower). Either one is difficult to melt scrap in especially if you have large gates and runners.

There are several ways to help with the headaches of operating crucible furnaces. Let's look at design approaches. *Some companies offer you quick change elements.* It makes you think they are in the element business instead of the furnace business. You design quick change elements if you *have to change them often.* The Schaefer Group, Inc. electric crucible furnace is designed so that the elements last over two years and when you have the bowl out for replacement you can easily splice in a section of element if needed or replace the entire bank of elements at that time. In our gas fired units we fire high and flue low forcing the products of combustion down around the entire bowl. This utilizes the *maximum amount of BTU's out of the gas stream.* If you fire low and flue high some of your products of combustion ( POC) will rise and short circuit out the flue ( because heat naturally rises). These are important features that need to be looked at when deciding on a crucible furnace.

Here is some basic advice for operating crucible furnaces cost effectively. First and foremost do not drain the bowl more than 4 inches during production. Heat will concentrate at the top of all crucible bowls and if there is no metal inside the bowl at that point the silicon carbide bowl will expand and crack at the top of the bowl. So if you are losing bowls because they crack at the top, you will need to deliver metal to them more often. Of course if they are cracking at the bottom or getting pin hole leaks in them you need to look at the burner placement it may be too close to the bowl. You also could have a gorilla throwing ingots in the furnace and cracking the bowl. With a little better operating practice you should get better than a years life out of the bowl.

Wet bath melter/holders at the machine offer some distinct advantages. First is the ability to have more controlled metal temperature. If you control the melting process at ¼ the hourly rated capacity every 15 minute these furnaces will hum along at temperature all day long. You no longer have to worry about delivering cold metal to the holding furnace and you can pre-heat your ingots on the charge well wear plates which will save energy. You can also install a conveyor to bring your gates and runners right back into the charge well of this melter/holder. This way they arrive still hot from the casting process and will save you energy. If you are trying to melt 300#-1,000# in a crucible furnace you need to figure up the operating costs of both types of units to see which one is most cost effective for you.

## FUEL SAVING TECHNIQUES

One of the easiest changes you can make to a melting furnace to save energy is to install a half flue cover for use during idle conditions. Obviously automating this will save a lot of time and effort and is a lot safer. If you do put in a manual half flue cover make sure the people are well trained on when it should be utilized and when it needs to be 100% open. By closing up the half of the flue you save energy by slightly pressurizing the furnace. This reduces the amount of extra air being pulled into the furnace by a larger flue. As most of you already know flues are designed for high fire or slightly less than 100% output. So when you are at idle on low fire the furnace is going to a negative pressure situation. Keeping the furnace at a slightly positive pressure will allow more energy to be absorbed into the metal instead of trying to heat up all that cold air being pulled into the unit when the flue is 100% open and this saves you energy. The best method is to install an automatic kinetic air damper over the flue. It is more expensive, but much safer. The control for this air damper is tied to the air butterfly valve and gives more air to the damper at low fire and less at high fire. This can potentially save you over 1-2% in fuel usage over the life of the furnace and potentially making this about a 19 month payback for your ROI depending upon the furnace size.

**WARNING: YOU MUST MAKE SURE TO OPEN THE MANUAL FLUE HALF COVER BEFORE GOING BACK INTO PRODUCTION OR TO HIGH FIRE!**

### The Schaefer Group, Inc.

*Large Gas Fired Reverbs*

- Standard Combustion System
- Recuperation
- Regenerative



**7,000 lb./hr. (3175 kg./hr.)**  
**60,000 lb. (27.2 metric ton) hold**  
**Radiant Roof-Fired Reverb**





**60,000 lb. Gas Reverb**  
**36.25 metric tons**



**SCHAEFER FURNACES**



**75th Anniversary**



**FWS**

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Auto Flue Cover ^











**Editorial:**

Being this special time of year most of you may be on vacation( albeit not planned) and may not get this till next year, however I would like to reflect on what we should be thinking about this time of year. Regardless of your religious beliefs think of your fellow man this Holiday Season. More and more charities are crying for help this year as the giving has slowed down just like the economy. We have several people heavily involved in charitable organizations here at Schaefer and are proud of their efforts and commitment to help the less fortunate.

So my wish this month is for all of you to do something extra this Holiday Season. Buy an extra toy this year and give it to Toys for Tots or the Salvation Army so that needy children can have a smile on their faces this Christmas. I do realize that it is not about gifts this time of year, but I have to tell you there is no better feeling on earth than seeing a child's face light up when they see a present under the tree with their name on it. To watch their little faces shine when they tear into that ribbon and paper to see what Santa has brought them is what I remember most about Christmas at my house. Now I get to do that all over again with my grand children. If everyone did one extra thing for the less fortunate this Christmas what a difference that could make!

At the risk of being politically incorrect, I would like to wish you all a very Merry Christmas and a happy, safe and prosperous New Year.

**Ask about SGI's "*Halt Energy Loss Program*"! We can help you save energy. Visit [www.theschaefergroup.com](http://www.theschaefergroup.com) for more information.**

 <p><b>Gas Fired Package Burner</b></p>		 <p><b>Zinc Pot Furnace</b></p>	
 <p><b>Gas Fired Burner System</b></p>		 <p><b>Electric Crucible</b></p>	
 <p><b>Electric Element Package</b></p>		 <p><b>400 lb/hr Electric Reverb</b> 181 kg/hr</p>	
 <p><b>Electric Reverberatory Furnace</b></p>		 <p><b>Gas Reverberatory Furnace</b></p>	
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