

BENEFITS OF TAKING YOUR MELT AREA INTO THE 21ST CENTURY



The
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ARTICLE TAKEAWAYS:

- Optimizing Melt Area through Integration.
- Eliminating Melt From Customer Quality Issues.
- Lowering Scrap, Increasing Productivity, Increasing Overall Efficiency.

As I travel around the world seeing processes of all shapes and sizes, one thing becomes very clear – that melt shops are most often left out of any and all of the latest technology improvements.

It seems that everyone gets caught up in the latest molding automation or machining trend and directs most of the attention on those aspects of the casting. Making a part a couple seconds faster or machining a part faster with new tooling seems to garner the most attention and excitement. Watching how excited operators are to try the latest in coolants to increase the throughput and efficiency of the finished part, I often think – how is it that the melting process lacks getting this kind of attention as a way to increase results.

The foundry melt shop seems to be the forgotten culture of the die casting industry. Companies will sink plenty of capital into the casting process, machining process, and trim presses, but when it comes to the melting process it is all but forgotten.

This paper is making the case for reviewing what I call the “Foundation of the Process,” which is the melting process. With anything in life no matter what it is, if you don’t start out with a great foundation then you will constantly have issues that will plague you throughout the entire journey.

Furthermore, having the cleanest metal possible at the correct temperature on a consistent basis, pays off day-in and day-out. To achieve this, think about integrating the melting process. Most often the melt shop is thought of as an entity on its own. Integration however, is one of the best tools available to optimize the melting process.

Think about it... When there is a quality issue with a customer no matter what the failure mode of the failed part, the process that is on the front line to defend itself first is the melting department. Several aspects in the melting area are going to be attacked first:

1. Was the metal cast out of specification? Have the metrology lab results for the day/shift of the failed part.
2. Was the metal cast out of temperature and either too cold or too hot?
3. Was the hydrogen level out of specification?
4. Are the furnaces actually being cleaned on a set schedule?
5. If alloying, information from the charges of each heat.
6. Tapping temperature of each ladle.

This list can go on and on, depending on your process.

What if you had an integrated system to track all of this information? What if this system would automatically shut down critical aspects of the operation to prevent a part from being produced out of specification? Do you think optimizing your melting process would be of benefit? Sure it would!

There are just a handful of foundries I have observed that understand the importance of implementing a fully integrated melting process. I also note that all of these facilities are world class operations and produce extremely high quality, high integrity parts.

Not only does the melting process benefit from this kind of integration but the entire process of the part as well. Integrating the melt process benefits all parts. A solid melting foundation reduces scrap and increases productivity, which means the bottom line is enhanced.

Imagine if your melting process was all on a monitor, laid out just like your furnaces are on your plant floor, and that each monitor was color-coded for each stage (each color for a different meaning) that could be easily understood from a glance of an eye. Very quickly you could know exactly the stages and operation levels of all of your furnaces.

From a monitor on your desk, you could also view each furnace along with their temperature readings. This could also be displayed in strategic areas on the plant floor for everyone to observe. How much more effective would this be - to catch an issue before it becomes a problem?

With a glance of an eye in passing, you would be able to see everything is green which means everything is in tolerance and can then focus on other issues in the process. If there is an issue and something has turned yellow (which means getting close to being out of tolerance), you can take quick action to prevent it from turning red (which means a stoppage in production or a possible quality issue).

There are also programs to stop the casting machine when it turns red, to prevent it from producing a part out of tolerance. Imagine how beneficial this would be to decrease your scrap, increase productivity, and eliminate a quality issue.

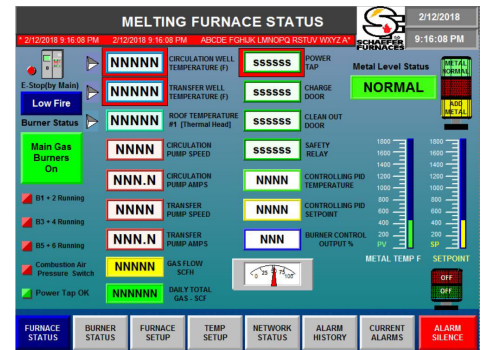
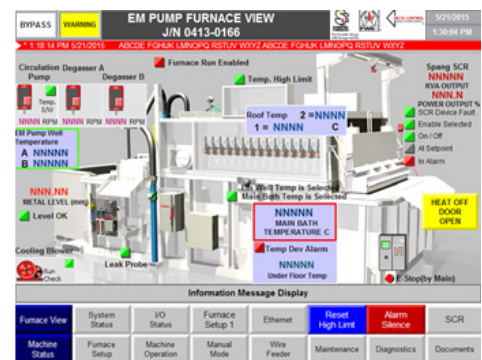
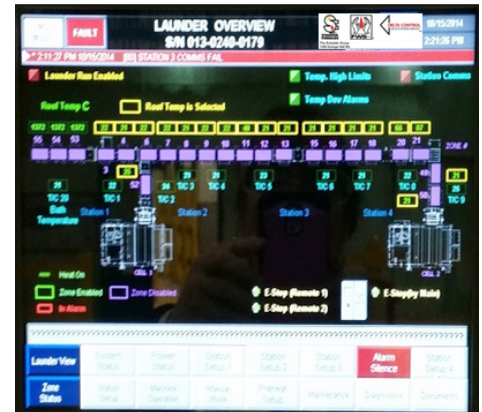
When your process will not cast a part that is out of tolerance this eliminates the melting process from being part of the quality issue. The system can also be programmed to signal when a casting furnace is getting low and needs to be filled, which optimizes the melt delivery to the casting process. The options and possibilities are endless once the process has the ability to send data.

In an integrated system everything is time stamped and recorded for archiving the data for future reference. Everything can tie into this data collection and display including temperature set points, hydrogen checks, metrology, power usage per shift per pounds melted, gas usage per shift and per pounds melted. Tap well temperature in which the transfer pump will not operate if the temperature is out of tolerance, and a trend chart of each furnace's temperature per shift gives you great information in the event there was a large temperature swing (which could mean an element or over loading or other issue occurred sometime during the shift). In the foundry data is everything, and especially beneficial in the melting operation.

Conclusion: Integrating the melting process increases productivity and saves many ways:

- Operators can easily view at a glance, the furnace productivity throughout your plant to quickly address changes.
- Metal will stay in tolerance reducing scrap & increasing productivity.
- Automatic data collection will be critical for future reference and will track your process and progress.
- The melt process will not be a quality issue for your customers.

This type of awareness and application to your melting process will absolutely have positive effect on the bottom line.



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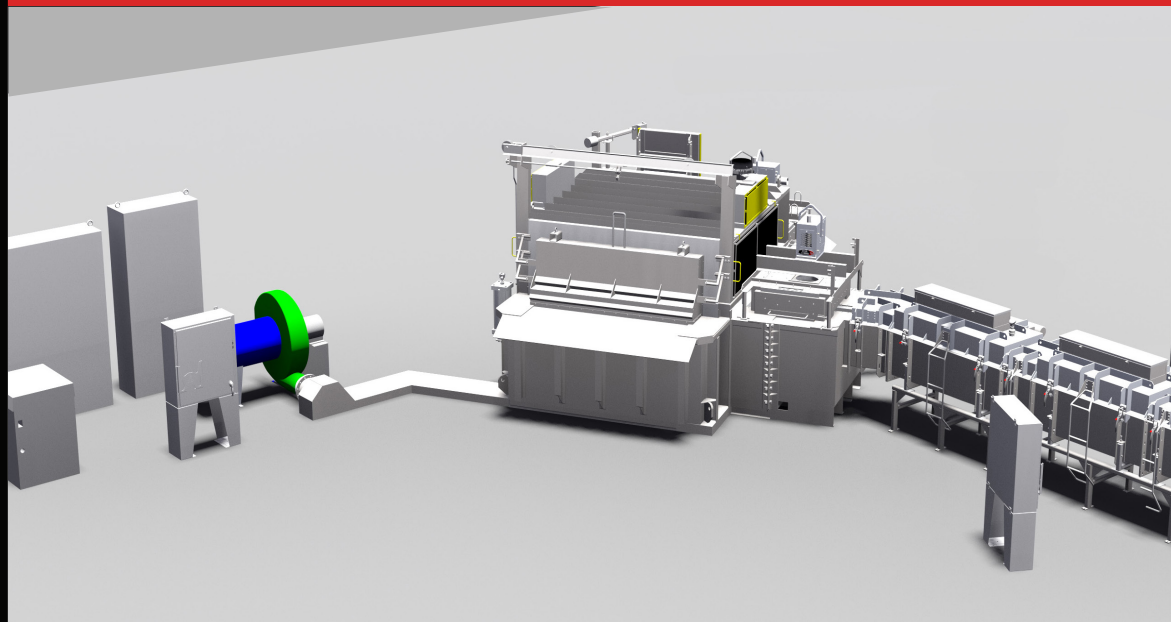
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