

# FURNACE DATA INTEGRATION



The  
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## ARTICLE TAKEAWAYS:

- Integrating the melt shop to reduce production variations
- Fully integrated systems are for foundries of all sizes
- Start data collection now and for future production

One fact stands out in my travels across North America, examining processes of all shapes and sizes: melt shops are frequently overlooked in technological advancements. Casting or machining a part faster garners the most attention and excitement, neglecting the foundational melting process, which has significant potential to improve outcomes.

Watching how excited personnel are to try the latest in coolants to increase the throughput and efficiency of the finished part, I often think – Why is it that the melting process lacks this kind of attention?

The foundry melt shop seems to be the forgotten segment of the die casting industry. Investments are poured into casting, machining, and trimming, yet the melting process is sidelined. I am making the case to review the “Foundation of the Process”—the melting process. If you don’t start with a great foundation, you will constantly have issues that plague you throughout the journey.

A consistent supply of clean metal at the correct temperature pays off day in and day out. Integrating the melt shop is an underutilized strategy to achieve this instead of thinking of it as a separate entity.

When faced with a quality issue, the melting process is typically the first to be scrutinized:

1. **Was the metal cast out of specification?**
2. **Was the metal temperature consistent or was the cast too hot or cold?**
3. **Was the hydrogen level out of specification?**
4. **Are the furnaces being cleaned and maintained on a set schedule?**
5. **For alloying, what information is there from the charges of each heat?**
6. **Is there consistency in the tapping temperatures of each ladle?**

These are just a few considerations in a complex process. An integrated system could track these variables, preventing out-of-spec production. Such optimization would be highly beneficial.



Only a few foundries appreciate the value of a fully integrated melting process, and these are the ones producing high-quality, high-integrity parts. This integration improves the melting process and enhances the overall part production. A reliable melting foundation minimizes scrap and boosts productivity, thus improving profitability.

Imagine your melting process on a monitor, with your furnaces reflected on a color-coded dashboard, each color reflecting various stages. At a glance, you could assess the status of all furnaces, with colors indicating different operation stages. From a monitor on your desk, you could view each furnace with their temperature readings. Such visibility would allow for prompt intervention before minor issues escalate.

For example, with a glance of an eye in passing, you would see everything is green, which means everything is

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in tolerance, and you can focus on other issues in the process. Suppose something turns yellow to indicate an issue (which means getting close to being out of tolerance). In that case, you can quickly prevent it from turning red (which means a stoppage in production or a possible quality issue). A program could stop the casting machine when it turns red, preventing it from producing a part out of tolerance. Imagine the benefit of decreasing your scrap, increasing productivity, and eliminating quality issues.

An integrated system would provide time-stamped data records, archiving critical information for future reference. Everything can tie into this data collection and display. This data, encompassing temperature set points, hydrogen checks, spectrometer data, and power and gas usage, is invaluable for maintaining operational integrity. In the foundry, data is everything, and it is especially beneficial in the melting operation.

### CONCLUSION:

Integration significantly increases efficiency and saves money by providing operators with real-time data, facilitating preemptive maintenance, and improving process oversight. Automatic data collection will be critical for future reference and will track your process and progress. Adding integration to your melting process is a multifaceted strategy that increases productivity, ensures quality, and reduces waste.

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