

# Dr. Die Cast



## Furnaces and Metal Melting. What's the Big Deal?

We sell castings! Quality, price, delivery: pick two! Why not all three? Quality starts with metal handling. Seems basic until you see how often this is overlooked. First we assume it is simple.

- Proper safety attire: Check
- At operating temperature: Check
- At proper fill level: Check
- Plenty of Ingot available: Check
- Furnace walls and floor clean: Wait a minute while I check
- Skimming and fluxing schedule: We do it on the midnight shift, what \_\_?
- Can the furnace be properly cleaned with the existing tools, scrapers, skimmers, and yes, the work platform?
- Temperature stable during and after charging ingot or scrap: Sure it drops, but how much?

### So what are some best practices?

- Repeatability is a word we throw around a lot and it starts with the furnace.
- Furnace operation is not a “part time assignment”. When done properly the furnace operator is often the busiest person in the whole plant.
- Smaller charges and more frequent will create less temperature variation. (Reducing sigma to the lowest level.)

- If you are charging with a bull ladle from a remelt furnace, are you maintaining the temperature between charges? (See above).
- Furnaces and the bath must be cleaned every shift and if there's a lot of remelt, then even hourly might not be often enough.
- Pre-heat ingots where it's possible. This will reduce energy usage and temperature variation.
- Most furnaces require a work platform so the operator can reach the extreme back of the furnace. Is your platform deep and wide enough that they can easily clean the entire bath?
- Was the furnace placed so there are no obstructions to the cleaning tools such as (building columns, walls, machines or furnace control panels, etc.?)
- It is not uncommon to check the chemistry of the bath by taking regular samples using a spectrometer. This is good, but doesn't tell us about the condition of the furnace.
- If you are using furnace filters, do you have a cleaning or replacement schedule?
- Hard spots in aluminum castings? See below.
- Who monitors the condition of the furnace? Supervision and management need at least basic training so they can inspect the furnace in order to schedule maintenance to the lining or thermal system. Whether it is electrically or gas heated, both should be monitored for loss of efficiency on a routine basis.
- In at least one case the furnace operator's rake handle was too short to effectively reach the farthest wall.
- The dip well must be cleaned as well. Is there a line of “demarcation” where the machine operator is in charge? If so, then are those persons equally trained? I have observed a dip well that had a couple inches of “Carborundum” laying on the bottom. It felt like a creek bed when you probed it. Fortunately it was still “loose” and hadn't joined to make a solid slab that would result in destroying the lining.
- “I need to save money on flux.” Nowhere is the old adage “Pay me now or pay me later” more true than in the proper application of flux and furnace cleaning. I have seen furnaces fail in 18 months and I have seen similar furnaces last over 15 years. Which would you prefer? Same furnace manufacturer, same locale, same alloy, same flux suppliers. What made the difference - people and procedures? You choose.

### Who's Dr. Die Cast?

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