Dr. Die Cast

Don't Miss the Point of Doing a Simulation!

As a consultant I get to review a lot of casting simulations. One of the common themes I see is that suppliers are coerced in to doing a simulation by their customer. They may or may not present the simulation to the customer. But they build the tool exactly as simulated. Sound great? Not really. What I didn't say is that they ran only one iteration and then built it, regardless of the results. Quite often they have totally missed the point of doing a simulation. The first iteration shows you where your assumptions are weak. Now it's time to make adjustments to the design of the gating and/or process and run it again to see if you've solved your problem. Simulation programs by themselves won't correct your problems, they provide results that you must then understand in order to make corrections. The program doesn't make decisions, it provides information so you can make adjustments to the design before you cut steel and waste time with dozens of samples in the machine.

Another common problem is failing to use casting parameters that reflect the real world. These include but are not limited to metal pouring/injection and die temperatures, cavity fill times based on machine capability, gate areas that allow for gate velocities that will not be destructive to the die cavities, vent areas and locations that will retain the molten metal without painting the ceiling with flash, etc.

Now I hope you don't get the impression that I'm against simulations. I highly recommend them, especially on castings with complex geometry. What we need to understand is the purpose of the simulation and our responsibility to adequately study and understand the results.

Years ago, when simulation programs were first introduced, our NADCA chapter hosted a sales engineer from one of the simulation software suppliers. We talked capabilities, software costs, maintenance and hardware costs (when the only computers capable were $20,000+ workstations), etc. At the Q & A I asked, "Now that I've invested in the system, I've only made the down payment because what I really need is the operator. What skill set am I looking for?" His answer was I believe profound then and remains true to this day. "I don't need a CAD designer or a computer scientist, but a process engineer. He will understand the results." Since then I've asked several simulation engineers about their background and their response supports his statement. It's not impossible for a CNC programmer or tool designer to learn to interpret the simulation results. Eventually they just have to become a die casting process engineer.

I hope you all had a Happy Holiday and wish you all a healthy New Year.

Who's Dr. Die Cast?

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