



Grainger & Worrall's Engineering and Technology Director, Keith Denholm discusses how ICE and EV production influence material production. Read the full transcript below.

Are ICE Parts Harder to Produce Than EV Powertrain Parts?

The combustion process is a dynamic process- you've got a gas exchange, you've got a big thermal exchange, you've got a mechanical exchange and then in all of that, you've got to manage it through temperature, so the castings have got multiple challenges to face. Over the last decade, one of the drivers for change in combustion engines hasn't been so much around the detail of the combustion process per se, it's been downsizing. It's been about creating more space around the engine within the vehicle, so that the vehicle would be lighter, and it would be more crashworthy so that there was more fresh air in the structure to crumble. If you take an inch off the length of an engine, you take an inch off everything- you take an inch off the vehicle length, an inch off the conrods and off the crank shaft. It becomes lighter in a very significant way. That has not caused the casting comp community to be innovative around the actual construction of the casting so much, but just to make everything in a smaller space has become challenging. You can't just take a casting and downsize it infinitely, because at some point you reach the limits of achievable wall thickness and core interior core survival and things like that. So, we've been challenged more on precision and survivability and durability of our process over the last 10 years, not so much the architecture or the principle at play, which is this composition process. None of those though are present in the electric motor to the same extent. A simple design, like an engine housing mega die casting, will be your most net shape to start with and will require fewer machining operations and material subtractions in order to get to the finished part. Wall thicknesses can be controlled through that.

Want to find out more about the role of sand casting in electric vehicle manufacturing? Read our free eBook, **Making EV Components with Sand Casting**.

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