



GRAINGER & WORRALL

Grainger & Worrall's Engineering and Technology Director, Keith Denholm discusses how a global metal would influence and impact manufacturing processes. Read the full transcript below.

How Would a Global Metal Influence Manufacturing?

In this company, we have, for example, 10 or 15 live and active different types of aluminium alloy. They're similar, but not actually the same, so the following process makes it very difficult. Once you have got something in there to get it out, you can. You can just keep diluting it down and down, but you have to dilute it with something pure, and that is more expensive. So, what you want to do is make sure that you don't rely upon these very precise compositions to start with, and that's about solidification, optimization, and designing for purpose. Modelling is helpful, but it's about ensuring that you don't contaminate or confuse your raw material feedstock, so that you get these contamination of possibilities- everything is actually just one generic material. You don't then have these problems of having to re-dilute, all you ever have to do is just ensure that you don't lose the quality as you take it through these cycles of use. Quality is measured. Mechanically, it's the attributes of strength and elongation and fertility and all these sorts of things. They are often related to the levels of oxide and things which occur naturally in the use of aluminium, which is a very reactive material. The modelling of that on an atomic level is starting to work out how to accept the realities of casting reactive materials in an atmosphere like Earth and turning that to an advantage rather than a disadvantage. That's quite interesting research. We have started to work with Brunel, for example, on aspects of that where there is now a sort of TRL level one, level two sub demonstration going on, where they're starting to demonstrate the way of managing that quality loss when that's upscaled and is available. In theory, it'll be like water- you reuse it. You just have to clean it every now and then, but it's the same stuff. That would be quite transformational for the industry because it would mean that the science of metal control would have to up its game. The metal processing industries would become single material processing units, just ingots would come from one place making the same stuff every day, like water. So, I think it'd be

transformative for the industry. As a prototype, of course, we would need to be able to replicate those things, which would be one of the challenges that this team will have to face over the coming years to ensure that we are relevant and aligned to that, so that our prototypes can remain valid, representative, and useful at the right time.

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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