

MAGNET ATTRACTION

What's the story?

Magnetic Applications Limited (MAL) is the only magnet manufacturer offering a bespoke service for magnetising fixtures to be designed and built in-house.

To improve magnetic performance of their components, MAL needed research support which would enable the alignment of anisotropic NdFeB alloy powders when loading the powder into the tool die body. The results are showing significant new business potential.

This SPARK was awarded to Cranfield University, which is one of Western Europe's largest academic centres for strategic and applied research, development and design and is at the forefront of working with UK industry.

What went on?

A series of designed experiments were undertaken to investigate the significant parameters of the magnetic powder die pressing process. These were undertaken with anisotropic powder, but based on MAL's system which was formulated for isotropic powders.

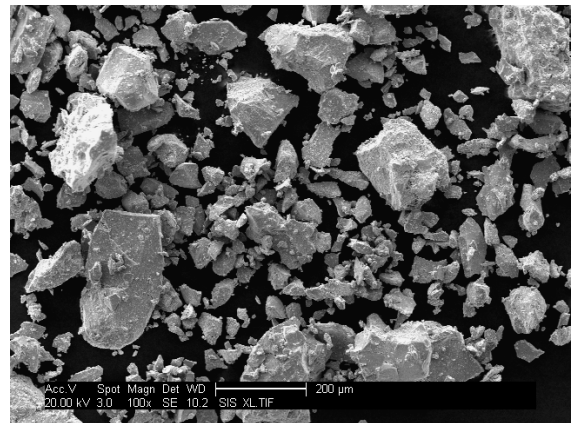
Lubricant quantity, resin quantity and resin temperature and time effects were examined as individual variables. A structured experimental design analysed the effects of these variables on the die pressing of the powder on the part density. The levels of die pressure, resin quantity, resin temperature, coupling agent and time in die before pressing all had statistically significant effects on the density. However, lubricant, pressing speed and time maintained at temperature did not.

What happened?

The work showed that significant increases in density can be obtained during pressing that will lead to a direct improvement in magnetic performance. There was also strong evidence that corrosion protection can be greatly increased with the right choice of additives.

These results are already of benefit to MAL, who are improving performance from their current design, and as corrosion in bonded NdFeB is an issue in many

environments, particularly in most automotive applications, should have a significant commercial advantage. Already, two companies have expressed a significant interest in the properties offered by this technology. One of these customers has a specific project with a potential sales value in excess of £300k for 2006/7 rising to £5m over 3 years.



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