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**Re: Research Project entitled: Development of the rheoforming technologies for wrought Mg alloys'(EP/050839)**

Innoval Technology has supported this project and we have become more convinced of the potential benefits of the high shear melt conditioning technologies for the future successful exploitation of magnesium alloys particularly in wrought product forms. Magnesium alloys, in particular, are restricted by the limited range of castable alloys, concerns about corrosion properties, creep at moderately elevated temperature and porosity issues that limit mechanical properties. The crystal structure of magnesium severely limits conventional forming operations like extrusion and cold rolling.

This project has demonstrated significantly improved magnesium alloy microstructures by the continuous casting of strip from a melt conditioned liquid. The work has the potential to put the UK magnesium industry into a leadership position in the provision of high performance wrought magnesium alloys for automotive and aerospace applications. Alloys cast from processed melts have demonstrated exceptional mechanical properties particularly in terms of ductility both at ambient and high temperature. In addition, this development has the potential to provide both high performance castings and a feed stock for extrusion. The work has provided clear insight into grain refinement of magnesium alloys by the dispersion of magnesium alloys. In essence magnesium alloys can be made to be self grain refining using their native oxide provided it is finely dispersed by high shear melt conditioning.

The research has the potential to increase the use of both cast and wrought magnesium from its present application base of components in instrument panels and drivetrains and could result in magnesium sheet and extrusions to contribute to lower weight, low carbon vehicles as an alternative to aluminium alloys

In 2004 Innoval participated in at DTI Global Watch mission to Germany, Italy and Austria to evaluate the position of UK magnesium technology in a European context. One firm conclusion of this mission was that the UK could develop a prominent position in magnesium alloy technology based on the potential of the BCAST melt conditioning developments. This has been confirmed by the results obtained within the research programme

The results obtained within the project have exceeded our expectations and have demonstrated twin roll cast magnesium strip with a uniform fine grain microstructure without centre line segregation for the first time. The research has also shown that magnesium alloys containing aluminium can be grain refined by magnesium oxide dispersed throughout the melt by high shear melt conditioning.

Yours sincerely

A large black rectangular box redacting the signature of the Chief Scientific Officer.

Chief Scientific Officer

Company number : 4583982