

Novel Research on Cast Aluminium Products Wins International Award

A research team from Brunel University London in the UK has won the 2016 Charles Hatchett Award. The award-winning research has considerable potential for commercial application in aluminium cast products in the automotive industry.

([PRWEB](#)) August 08, 2016 -- The use of niobium as a grain refiner in cast aluminium alloys allows the manufacture of lighter aluminium parts, contributing to lowering the overall weight of vehicles, reducing fuel consumption and emissions.

The annual Award, now in its 38th year, is sponsored by Companhia Brasileira de Metalurgia e Mineração (CBMM). This is only the second occasion the award has been made for work on aluminium-based materials. Over the last 20 years significant progress has been made in vehicle light-weighting through the use of advanced high strength steels. This has allowed automotive manufacturers to meet increasingly stringent EU automobile emission targets. Further progress in this area will require the use of other light-weight materials, including aluminium alloys. To maximise the benefits available from the use of cast aluminium components it is important to optimise strength levels and minimise property variability. This can be achieved by refining the microstructure in the cast product.

The 2016 Charles Hatchett Award winning work focuses on the development of Nb-B based inoculants for use in the production of aluminium alloy castings. These inoculants were shown to be effective in widely-used commercial Al-Si casting alloys, especially when the Si content is higher than 5%. Above this level of Si, conventional Ti-B inoculants lose their effectiveness as a grain refiner. Significant refinement of the cast microstructure was obtained over a broad range of cooling rates, encompassing those found in common casting methods such as die- and sand-casting.

The award winners, from Brunel University London, UK were presented with their medals at the Institute of Materials, Minerals and Mining (IOM3) dinner held in London on the 12th July.

The following day, the lead author, Dr N. Hari Babu, presented the winning project at a seminar held at the Royal Society of Chemistry. The international seminar “Niobium for Aluminium Cast Parts in Automotive Components”, sponsored by CBMM, was attended by experts from the automotive supply chain and academia. The presentation described the fundamental metallurgy behind the design of the novel Nb-B inoculants and demonstrated their effectiveness in producing microstructure refinement at the laboratory scale.

The seminar was chaired by Dr Naila Croft from Beta Technology, the UK based company which manages the annual award process on behalf of CBMM. As International Coordinator of the Award, Dr Croft commented “We were delighted to host over 40 delegates in London for our important technical seminar. The speakers have described the initial development of the novel Nb-B inoculants. However, by bringing together representatives from academia and the automotive supply chain, the route to full commercial implementation of this development has been demonstrated.”

Marcos Stuart, CBMM’s Director of Technology also noted “This international award is part of our activities to recognise excellence in research on niobium and its applications. There is no single solution to vehicle light-weighting, the important thing is to have the right material in the right place. There are technical and cost challenges to the adoption of large aluminium alloy castings, such as engine blocks, which include efficiently

filling the moulds during the casting process. The Nb-B inoculant refines the grains, improving the fluidity of the material being cast, and therefore making it easier to completely fill the moulds, leading to a higher integrity product. It is now up to the supply chain to act to ensure the adoption of this exciting new technology.”



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