

IMPERIAL MINING AT THE WORLDS BIGGEST AVIATION SHOW.

Imperial Mining recently attended the Farnborough Airshow, the world largest gathering of Airplane Manufactures and companies providing materials and solutions throughout the Aviation supply chain. To provide you a sense of how big, over 100 countries were in attendance, and over 2000 companies involved in the Aviation supply chain were exhibiting, OH...and US\$192bn in deals were announced which was up by \$67.5bn from the 2016 Farnborough Airshow.

You do not really get a sense of just how big the show is until you have visited, of course, selling Airbus A380's is always going to need space! However, it's the impact on the village of Farnborough itself which provides the first clue with a complete one way system and restricted access set up throughout village. I have been to plenty of trade shows in my time, however this is by far the most impressive. Yes, there are plenty of aircraft to keep even the most avid fan of aviation happy. However it's the exhibition halls and individual display villages for the larger aviation and defence businesses such as Boeing, Airbus, SaaB, Lockheed Martin, GE et al that are impressive.

The major theme for this year's show was digital transformation under the heading of Aerospace 4.0; with quite a few subheadings of different technology areas. One in particular stood out: Additive Manufacturing or AM. The impact of AM is already being felt across the complete Aerospace market, this was very much evident by the volume of companies showcasing their services as part of the AM value chain.

In spite of the industries well known approach for moving at glaciers pace for any new product, component or process to be certified, AM has its sights firmly on the future of aviation. Well known is that the industry has the largest carbon footprint per tonne-km compared to any other type of transport method. The changing regulatory framework and economic benefits of fuel efficiencies means the aviation industry is striving to keep being relevant in a world that is seeing increased need for Air Travel and improved defence capabilities.

For Imperial, lightweighting is a key focus high on the agenda of Aviation Companies, of course, simply making aircraft lighter is not a simple task; Aluminium and Titanium alloys as well as new composite materials unlock some of the potential for making planes lighter but achieving substantial weight loss while maintain strength is no easy task.

AP Works have attempted to tackle this conundrum with the introduction of Scalmalloy™, an aluminium-magnesium-scandium alloy powder which has been designed for the AM market on all powder bed AM machines. AP Works and its Powders partner, UK based LPW co-hosted a stand in the Aerospace 4.0 zone showcasing the now famous light Rider electric bike with the



frame weighing in at positively ludicrous 7kg. (lighter than my Carbon Road bike). PR stunt aside, APworks is focusing its efforts for adoption of the Bionic Partitions system manufactured from Scalmalloy™. The innovative Partition Design is structurally very strong and 45% lighter than current designs due to design optimization and the use of Scalmalloy™ compounds the fuel savings and reductions in CO2 emissions of up to 465,000 metric tonnes per year.



The key though for Scalmalloy™, is AM, the design of the Partition cannot be made using traditional fabrication methods, however combination of AM and modular structures, the Partition can be installed in existing aircraft cabins so retrofitting aircraft to reduce weight and improve fuel saving and CO2 reductions is something really exciting for the industry.

For Imperial, we are so excited that we have our Crater Lake project, the possibility of being North Americas only commercially viable and reliable supply of Scandium at a price that is realistic is something to be excited about. With APWorks and Scalmalloy™ showing what can be achieved in lightweighting we cannot wait to be at the next Farnborough Airshow in 2020 with partners showcasing more options for lightweighting in Aerospace.

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