

Material man

■ Christopher Hounsfield



This industry expert believes that an agreed, universal aerospace industry format for submitting instructions to test labs will be essential to cope with the increase in the demand for testing

The most important current technological development in aerospace testing is arguably the ability to meet the fresh demand for testing of carbon fiber composites in an industry built upon and dominated by the testing of metals. This is requiring materials testing laboratories to learn new technologies, methods, and expectations of material behavior during test and evaluation.

Westmoreland Mechanical Testing & Research Inc provides mechanical and chemical testing of materials primarily in the aerospace and defense industries, but also in the automotive, marine, medical, and nuclear sectors. This involves a range of techniques, such as fatigue durability testing, tensile test, corrosion, chemical analysis, metallography, stress rupture and creep, fatigue crack growth propagation (da/dN), and failure analysis.

Managing director and technical manager for WMT&R (UK) Neil Poyner says that despite the advance to lithium alloys and carbon-fiber composites, timescales have not taken this dramatic technological change into account: "In materials testing, that translates to the shortest possible turnaround time from receipt of material by the lab through delivery to the customer of test results. However, we believe that never before in history has that demand for shorter and shorter turnaround times ever been stronger. In a global marketplace where inventories are driven by 'just in time' deliveries, and colossal aerospace projects are plagued by production challenges such as the Airbus A380 and the Boeing 787, materials testing

laboratories are called upon, and are required to execute tasks to meet increasingly tighter timelines. As quality project engineers like to say, 'In the aerospace business today, everyone has money, nobody has time.'

Poyner heads up the UK site, which is celebrating its fifth birthday, while the US parent is celebrating its half-century. The UK site is located in north Oxfordshire and has grown rapidly since its launch in April 2003. It is following in the footsteps of the North American parent by rapidly gaining accreditations, both UKAS and NADCAP, plus many individual aerospace supplier approvals. By European standards, testing capacity, particularly with regard to fatigue testing, is large.

Customers submit to companies like WMT&R many hundreds and thousands of parts, components, and materials on a regular basis, each using a different format to submit their testing specifications and a different requirement for the results format. Poyner argues that in this transition period, the system must change: "The systematic processes of how we achieve the result will have to be upgraded. The reality is this: any independent materials test lab that has X number of customers has X number of different formats that have to be deciphered by the lab to be logged into a laboratory information management system.

"To reduce confusion in general," he continues, "the industry will need to adopt an agreed upon, universal, electronic format for submitting testing instructions to test labs. Test labs must have the technological flexibility to provide test results in any electronic format and design that the customer requires.

"The goal has to be, from RFQ (request for quotation) to Test Report, that the same key stroke is not paid for twice. True, we are sending data more and more in industry-recognized formats, but there is still a long way to go before test labs and their partners can arrive at some form of system commonality."

Poyner maintains a romantic notion of aviation, but predicts future improvements. "I foresee the development of testing hardware and software that is more robust, and provides results that contain less uncertainty," he says. "There is also tremendous potential for automation and robotics in the areas of mechanical testing. The aerospace industry represents one of the highest achievements of the human race to date.

"Going back only 100 years, look how much the aerospace industry has accomplished! Flight, let alone supersonic flight, and landing men on the Moon – and even better, returning them home safely... It's all a testament to what we can achieve when we are motivated to do such things." ■

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