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MANUFACTURING TECHNOLOGY

Titanium Titan

Veteran metals producer capitalizes on aircraft composites boom

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Pat Hassey spent much of his career railing against the use of composite materials as a substitute for aluminum. But today, the 62-year-old metals industry CEO can be heard expounding on how the increased use of composites in next-generation aircraft is going to make his shareholders a lot of money.

The reason: Hassey's company, Allegheny Technologies Inc. (ATI), is one of the world's leading producers of aerospace-grade titanium, a difficult-to-make

Hassey, a former executive vice president at aluminum supplier Alcoa, came out of retirement in 2003 to lead the Pittsburgh-based company (*AW&ST* June 4, 2007, p. 10). He has sought to capitalize on three years of record orders for new jets and decisions by Boeing and Airbus to incorporate more weight-saving composites in their next-generation transports, the 787 and A350XWB. Aerospace now accounts for 31% of ATI's \$5.5 billion in annual sales, up from 24% in 2004.

"We're pushing it toward 40%," Has-

to ensure its growing needs were met.

Executives at ATI say titanium is a better match with composites than aluminum because it has a higher strength-to-weight ratio and won't corrode when it comes into contact with composites nor in higher-humidity cabin environments. The 787 airframe is 50% composite, 15% titanium and just 25% aluminum alloys. The design of the A350XWB is 53% composite, 14% titanium and 19% aluminum. Production of titanium typically precedes aircraft final assembly by 12-18 months.

Titanium prices rose 163% between 2003-06, according to the U.S. Labor Dept.'s Bureau of Labor Statistics. But prices have eased about 40% since their peak in late 2006, as ATI and others have expanded production capacity. UBS Investment Research analyst David E. Strauss estimates the supply of titanium sponge increased 35% last year and will rise another 50% by 2010. He adds that 787 production delays should help reduce near-term demand.

ATI is investing about \$1.2 billion over three years to increase its production capabilities. That includes the world's first new titanium sponge plant in 30 years, scheduled to be up and running next year in Rowley, Utah, and the \$260-million expansion of a super-alloy and titanium plant here, near Charlotte, N.C.

To be sure, aluminum suppliers aren't about to cede the aircraft structures market to composites and titanium without a fight. They say it's far from decided that the successors to the single-aisle Boeing 737 and Airbus A320 will use as many composites as the 787 or A350XWB. Alcoa is working on hybrid metallic/composite materials as an alternative to composites. And Stork Aerospace of the Netherlands has developed a lightweight hybrid aluminum-composite used on Airbus's A380 that is 25% lighter than standard aluminum and has significantly greater fatigue resistance.

ATI concedes that a 15-month delay in the 787's certification has brought near-term uncertainty to its supply chain, but stresses that Boeing has promised to honor its agreement. Concerns about the 787 delays and the impact of the sputtering U.S. economy on aircraft demand have contributed to the approximately 25% slide in ATI's stock in the past year.

Nonetheless, Hassey is convinced the 787 will ultimately generate a huge payoff for the company. Shareholders who have bet on him have done well. Last week, the company's "slumping" stock was still worth more than \$80 a share. On the day he became CEO, it was trading for less than \$7.

ALLEGHENY TECHNOLOGIES INC.



TITANIUM CONTENT PER AIRFRAME

Boeing 737	20,000 lb.	Airbus A320	25,000 lb.
Boeing 777	120,000 lb.	Airbus A330	37,000 lb.
Boeing 787	250,000 lb.	Airbus A380	150,000 lb.

Source: Allegheny Technologies Inc.

strategic metal that is more compatible with composites than standard aluminum. In simple terms, the more composites aircraft builders use, the more high-end titanium they need. Boeing's composite-laden 787 will contain more than twice as much titanium as the company's last new aircraft, the larger and heavier 777.

Titanium, which is extracted from sand, is one of the most abundant elements in the Earth's crust. But the job of turning it into finished aircraft parts requires complex and highly proprietary production and machining processes that only a few metals companies have mastered. ATI's fear of losing its secret sauce is a big reason the company has resisted shifting production outside the U.S.

ATI had fallen on hard times when

sey said at the recent launch of ATI Aerospace, an umbrella organization to coordinate the company's activities in the sector. Boeing and General Electric are ATI's two largest aerospace customers; it is only a minor supplier to Airbus.

ATI-made metals have been used in jet engines for decades, but the company didn't become a major player in the aircraft structures market until 2006, when it signed a 10-year, \$2.5-billion agreement to supply titanium to Boeing. The aircraft builder already had two titanium suppliers, Dallas-based Titanium Metals Corp. and Russian producer VSMPO-Avisma. But with worldwide demand for titanium forecast to reach 360 million lb. in 2011—triple the level in 2006—Boeing wanted a third supplier