The composites super cycle — are we still living the dream?

Predicted before the 2008 recessionary crash, the super cycle's foundations were to be built on an increasing use of composites in aircraft. How did it play out?

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For many advanced economies, 2015 was a landmark year. GDP finally recovered to levels greater than pre-crash for many major composites economies, including the US, UK, Germany, Japan, Italy and France. The consensus is that the world's economic recovery, whilst not 100% secured, is heading in the right direction.

Many in the composites industry will recall the times before the financial crisis of 2008. A standout memory for me was attending the 2007 *CompositesWorld* Investor Conference in New York, where industry sages, among them, Paul Pendorf from AMT II Corp. (Ft. Myers, FL, US) and Miki Dan from McGladry Capital Markets LLC (Costa Mesa, CA, US) painted a picture of an industry with unprecedented growth opportunities, driven foremost by a need to make aircraft and cars more fuel-efficient. Other factors were wind turbine blade construction, which was on the apparent cusp of turning all-carbon. New opportunities, such as CNG fuel tanks and composite cores for electrical transmission lines, were at the vanguard of a new consumption dynamic for composites, and especially high-value carbon fiber materials.

At the conference, Merrill Lynch presented an analysis of the future of composites companies involved in the aerospace industry that was very positive. Indeed, that forecast was my first introduction to the term super cycle, used to describe a perennially sunny outlook for the world's advanced composite market over a sustained period of many years, insulated from the usual economic turbulence by highly positive economic and market conditions.

The super cycle's foundations were to be built on an increasing use of composites in aircraft, which, in turn, were forecast to be built in increasingly greater numbers. The peak in growth was to coincide with the forecast introduction of redesigned narrowbody Boeing 737 and Airbus A320 aircraft families with 50% composite content. This was to follow an already growing market, driven by new composites-intensive widebody models (the Boeing 787 and Airbus A350 XWB), plus increased composites penetration into aeroengines, private jets, helicopters and more. The predicted peak of the super cycle was expected in 2016!

Prior to 2007, in the context of a predicted sustained boom in the use of composite materials, the share prices of the variety of companies involved in the composites supply chain looked like good value for the money. We were told that anyone taking a long-term view and investing in shares of publicly listed companies, such as Hexcel, Toray, Zoltek and Owens Corning, for example, would make considerable gains. And, in fact, had they held on to those shares until 2015, they would have made a nice return.

Merrill Lynch, however, did not emerge unscathed from the credit crunch: It was taken over by the Bank of America, which, in turn, was bailed out by the US government. No super cycle for them. But it is interesting to reflect on the predictions of that 2007 conference and what actually came to pass. Generally, the predictions were accurate for CNG tanks and other pressure vessels, and largely correct for the aerospace market. They were too optimistic, however, for the wind energy market and, in my view, too pessimistic for the automotive industry. In aerospace, aircraft building has, indeed, accelerated — dramatically more so than anticipated. Boeing and Airbus have introduced updated versions of their narrowbody ranges, in the 737 MAX and A320*neo*, with higher composites content. However, the introduction of the much-anticipated redesigned narrowbodies — the landmark opportunity for composites in the medium term — is now expected to come much later, in the 2030s or beyond. Further, the percentage of composites this represents is at issue. Although the wings are certain to be of composite construction, the practicality and feasibility of composite fuselages on narrowbodies is currently in dispute. It remains to be seen if Bombardier's *CSeries* and Mitsubishi's *MRJ* regional jets will influence the market dynamics. At the moment, all evidence points against this, but there could be a dramatic change should these composites-intensive models get some traction.

In general, I am very positive about our industry's prospects. We face some short-term challenges, as low oil prices take the pressure off those charged with finding immediate weight-saving solutions. But I believe the trend is toward wider adoption of composite structures when oil prices are low, because relatively lower cost composite materials (both fiber and resin are petroleum-based) stimulate greater adoption rates. Automakers will have a huge influence in this respect, because they need to reduce weight in order to curb emissions, the limits of which have been government-mandated. This will surely usher in a new adoption dynamic, which will give overall impetus to our industry.

Editor Pick

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