Commercial Aerospace Market Outlook For Titanium

TITANIUM 2006 Conference
John Monahan
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World Revenue Passenger Miles Up
22% from 2000 to 2005

Traffic growth is now nearly recovered from flat pattern after 2000

In Billions

Declines in RPM’s that affected demand for airplanes

Source: International Civil Aviation Organization
World Airline Operating Profits Recovering Nicely

$ in Billions

Source: International Civil Aviation Organization

Trailing 12 months results profitable for first time since 2000
Average Load Factors Dramatically Higher

Technology and Deregulation have created higher efficiency in airline travel, but this has its limits

Source: International Civil Aviation Organization
Commercial Aircraft Order Rates Spectacular

Based on the first six months of 2006, this year could be the third or fourth best on record, after an all-time record last year.

Source: Walsh Aviation

*2006 estimated based on annualized YTD June Orders
Commercial Transport Deliveries Increase 50% from 2003, Reaching 1300 Units by 2009

Source: Airline Monitor, Boeing, Airbus
Single Aisle Aircraft Continues to Dominate Production in Unit Output

Twin Aisle deliveries increase 160%, Single Aisle increases 75%, RJ’s decline 40% from 2003 to 2010

Source: Airline Monitor, Boeing, Airbus, Company Estimates
Twin Aisle Demand Driving Titanium Consumption

Compound effect of increased production and higher Ti content causes twin aisle consumption to grow from 40% to 80% of total demand

Source: Boeing, Airbus, Airline Monitor, Company Estimates – excludes spares
Commercial Aerospace Demand Forecast: Airframe Consumption Growth Outpaces Engine

- Engine requirements vary directly with build rates
- Airframe requirements vary with compound effect of build rates plus increasing content per unit
  - Driven by 787 and A380 popularity

Source: Airline Monitor, Boeing, Airbus, Company Estimates – excludes spares
Titanium Content per Aircraft Increases with Each Generation of Design

Estimated Titanium Content of Selected Airframes

- 0% 1950
- 4% 1960
- 8% 1970
- 12% 1980
- 16% 1990
- 20% 2000
- 24% 2010
- 28% 2020

Source: Trade Publications, Company Estimates
Airline Market Fundamentals, New Technology Altering Commercial Aerospace Titanium Demand Landscape

- Revenue Passenger Mile growth has increased significantly in the past two years, creating demand for more seats.
- Load Factors have risen significantly, but growth cannot be met from productivity improvements indefinitely.
- Airline profits are improving, creating ability to order more aircraft.
- Growth in applications for composites is permanently raising demand for titanium across the business cycle:
  - Titanium provides corrosion resistance not found in other materials
  - Advantages in maintenance and weight appear to lower operational costs for airlines, driving popularity.
- Early in the next decade we may see single aisle designs incorporating high composite technology, providing yet another boost to titanium demand.