Reference



April 12, 2005

# Strategic Business Expansion of Carbon Fiber, Torayca\*

- Production Capacity Increase of 25 Billion Yen Investment in Japan, Seeking for Carbon Fiber Sales of more than 110 Billion Yen in 2010 -

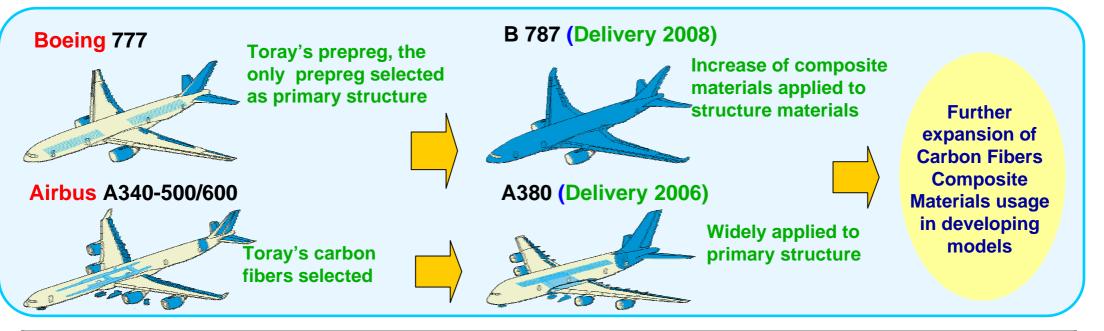
# **Toray Industries, Inc.**



## **Boeing B787**

Number of Seating : 200 ~ 300
Fuel Efficiency : 20% less fuel than other models at its size
Cruising Range : 6,500 - 16,000km
Cruise Speed : Mach 0.85
Entry into Service : 2008
CFRP : Approx. 35t / jet

### Increase of Carbon Fibers Composite Materials for Aircraft Application



Year	1982	1995	2006	2008
Model	B 767, etc.	B 777	A380	B 787
Structures	Secondary	Primary / Secondary	Primary / Secondary	Primary / Secondary
Amount of CFRP / aircraft	1.5 tons (B767)	Approx. 10 tons	Approx. 35 tons (estimate)	Approx. 35 tons (estimate)
Amount of CF / aircraft	1 ton (B767)	Approx. 7 tons	Approx. 23 tons (estimate)	Approx. 23 tons (estimate)

## **Characteristics of PAN-based Carbon Fibers**

#### **Characteristics of PAN-based Carbon Fibers**

- 1. Lightweight --- 1/4 specific gravity of steel
- 2. Strong --- 10 times as strong as steel
- 3. Rust retardant / Corrosion resistance
- 4. Others
  - Radiolucent
  - Chemical Resistance
  - Heat or Ultra-low Temperature Resistance

#### **Characteristics of PAN / Pitch Type**

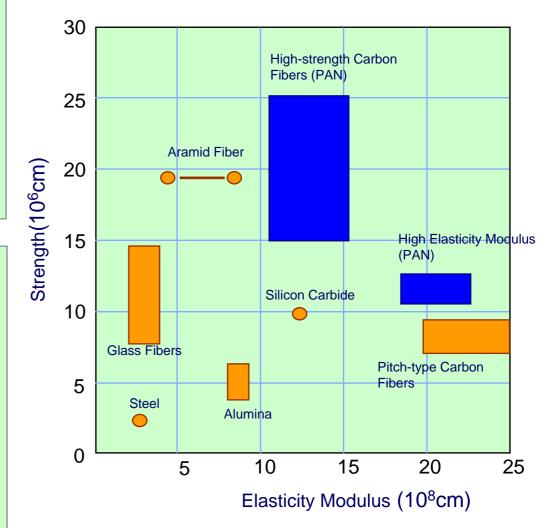
#### **PAN-based**

- High-strength
- Compatible with CFRP (Carbon Fibers Reinforced Plastics)
- Good balance with elasticity modulus

#### **Pitch-type**

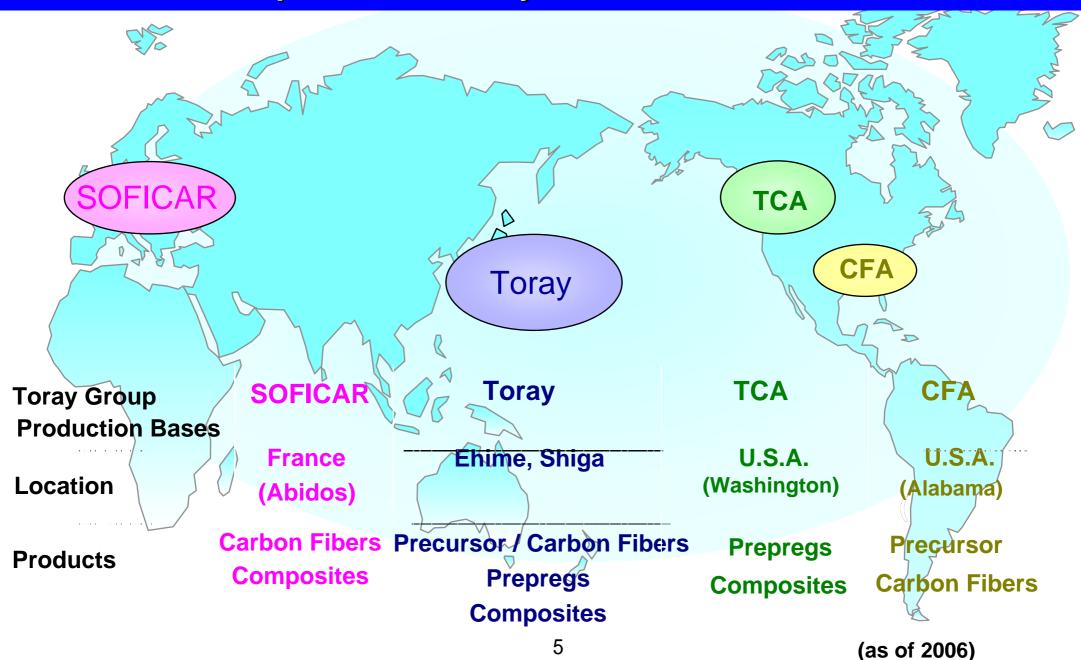
- Higher elasticity modulus compared to PAN-based carbon fibers
- Lower material cost compared to PAN-based carbon fibers

#### **Performance Comparison by Product**



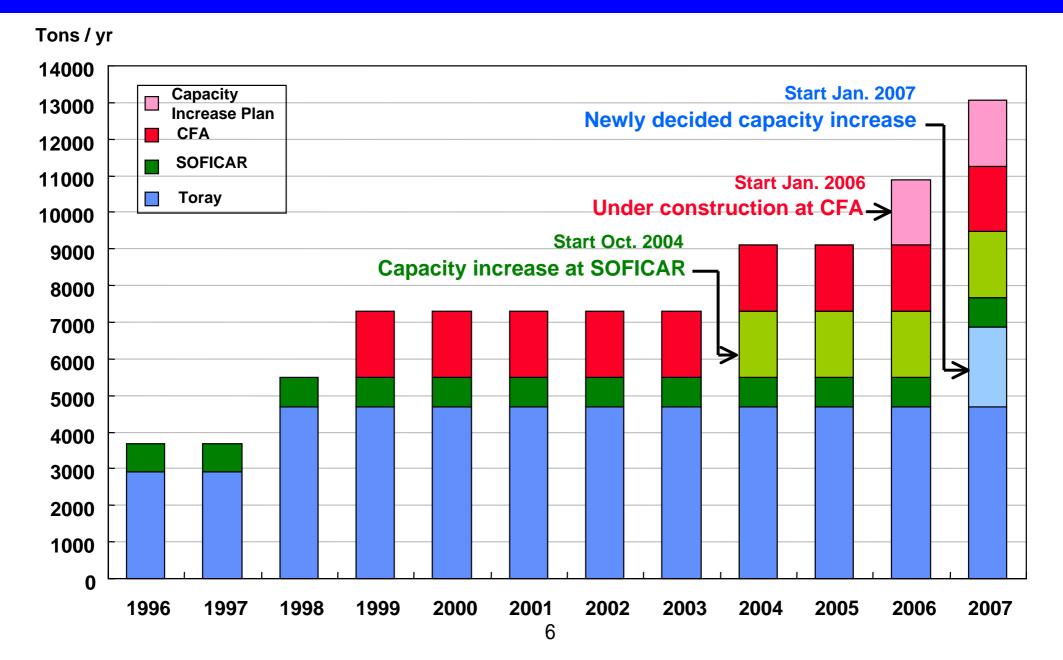


## **Global Operation of Toray Carbon Fibers Businesses**

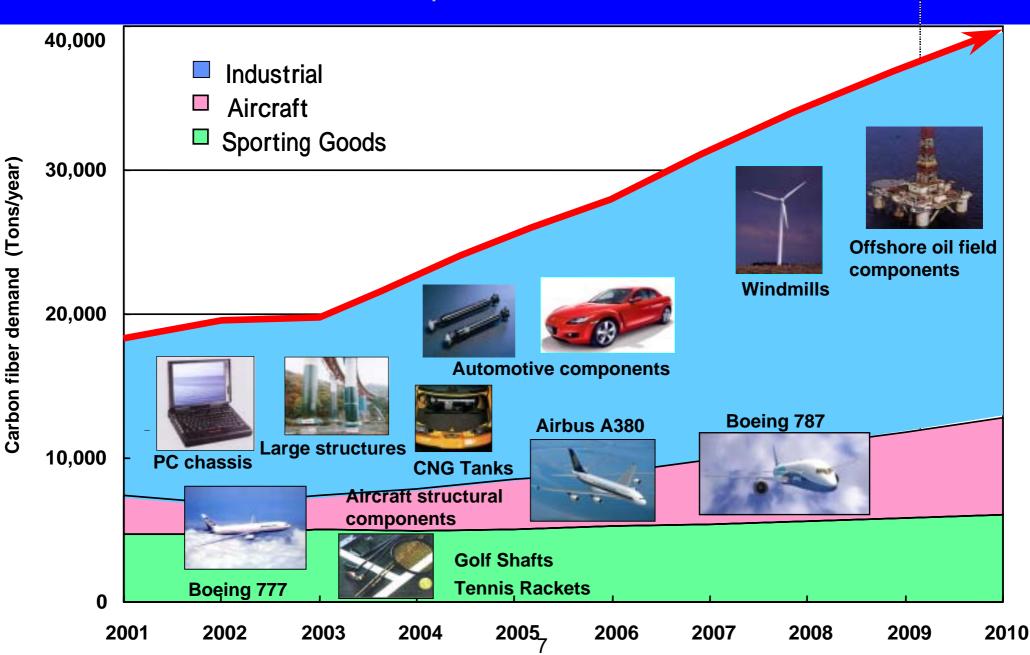




### **Production Capacity Trends and Plans of Toray Group Carbon Fibers**



## **Market Expansion of Carbon Fibers**



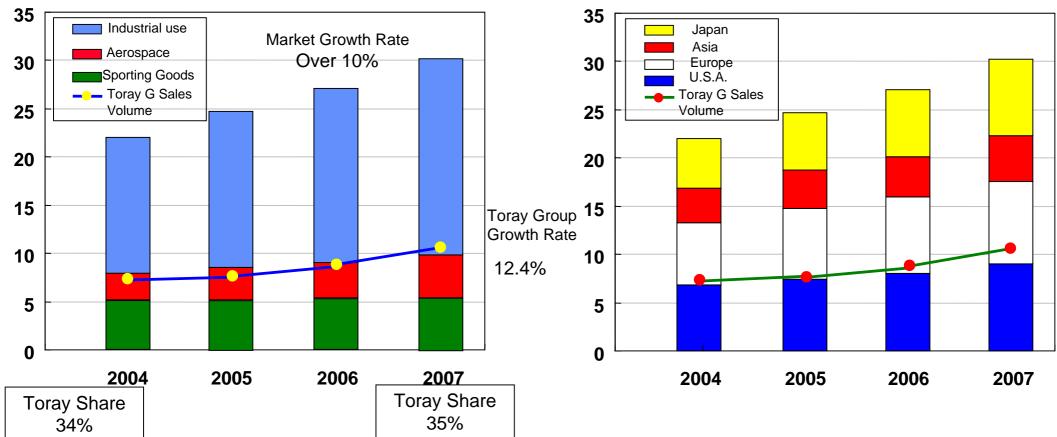
## World CF Demand Forecast and Toray Group Sales Plan by Application and by Region

Thousand tons / yr

### **CF Demand Forecast (by application)**

#### Thousand tons / yr

### **CF Demand Forecast by Region**

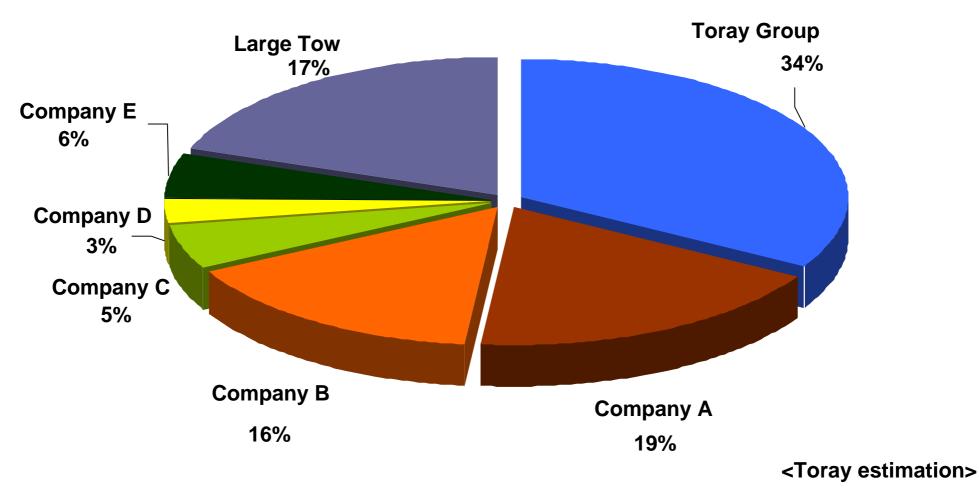


(include large toe)



## **World Market Share of PAN-based Carbon Fibers**

Total: 22,000 tons (2004)





## Reference

Toray Gro	up Production Cap	(tons / yr)		
		Present	2006	2007
	Japan (Ehime)	4,700 tons	4,700 tons	6,900 tons
	France (SOFICAR)	2,600 tons	2,600 tons	2,600 tons
	U.S.A. (CFA)	1,800 tons	3,600 tons	3,600 tons
	Group Total	9,100 tons	10,900 tons	13,100 tons

### **Toray Group Production Capacity of Prepregs**

(thousand m<sup>2</sup> / yr)

	Present	2006	2007
Japan (Ehime)	5,000 thousand m <sup>2</sup>	5,000 thousand m <sup>2</sup>	10,800 thousand m <sup>2</sup>
U.S.A. (TCA)	5,200 thousand m <sup>2</sup>	11,400 thousand m <sup>2</sup>	11,400 thousand m <sup>2</sup>
Group Total	10,200 thousand m <sup>2</sup>	16,400 thousand m <sup>2</sup>	22,200 thousand m <sup>2</sup>

### **Consolidated Business Trends of Toray Composite Materials Businesses**

Consolidated	Net Sales	Operating Income
Mar / 03 Actual	34.6 bill ¥	2.4 bill ¥
Mar / 04 Actual	37.3 bill ¥	3.6 bill ¥
Mar /05 Forecast	(47.0 bill ¥)	(6.0 bill ¥)



Descriptions of forecasted business results, expectations, estimation, and business plans contained in this material are based on predictive forecasts of the future business environment made at the present time.

The material in this presentation is not a guarantee of the Company's future business performance.