Overview of Use of Composites In China Automotive Industry
Fiber-Reinforced Plastic Composite Material in China -

Total Production of Fiber-Reinforced Plastic: 1.2 MM MT (~2.6 Billion Lbs.)

- Construction Industry;
- Container and Piping;
- Industrial Equipments;
- Transportation and Automotive;
- Electronics;
- Consumer products

Thermoset
87%

Thermoplastic (incl. Plastic Compound) 13%

Construction 40%

Transportation and Automotive 6%

Consumer Products 5%

Electronics 10%

Industrial Equipments 15%

Container/Piping 24%
Composite Materials in China Automotive Industry -

Exterior Applications: (~30,000 MT’s)

- FRP - bumper, front side, rear fender, Roof and etc.
- GMT - bumper beam, battery box, underbody shield, spare wheel tub
- LFT - front end frame, underbody shield

![Pie chart showing FRP 73%, GMT 26%, LFT 1%](chart.png)
Composite Material in China Automotive Industry -

Interior Applications: (~31,000 MT’s)

- LRT - FG Reinforced Thermoplastic - headliner, parcel shelf, sunshade
- FG Reinforced PU foam - headliner,
- Wood Grain Filled Thermoplastic - Door panel, Parcel shelf
- Natural Fiber Reinforced Thermoplastic - Headliner, Side/rear wall panel,
- Phenol Resin Composite - Headliner, parcel shelf
- PUR - Instrument panel, Sunshade

Composite Material Breakdown:
- Polywood Composite 45%
- Kenaf Fibre Composite 19%
- PP/FG Composite 7%
- PU Foam/FG Composite 16%
- Others 7%
Latest trends for Interior Materials In China:

- Mechanical performance
- Cost
- Odor and VOC
- Weight
- Moldability for Design & Style

1. Natural Fiber reinforced thermoplastics are being challenged for interior applications - moisture wicking characteristics and odor
2. Wood Grain filled thermoplastics do not support part mass reduction and have lower strength/weight ratios
3. Fiber Glass Reinforced Thermoplastics are growing
Highs & Lows of Composite Material Converters in China

**Highs -**
- Cost Control Efficiency
- Quality Control efficiency
- Flexibility

**Lows -**
- Product Development Capabilities
- Engineering Support Capabilities
- Technology Development
Doing Business in China
China GDP (in Trillion RMB)
**China Automotive Growth:**

“Asian” Region Growth 2005 to 2009

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<th>Region</th>
<th>Growth 2005-2009</th>
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**Annual Auto Build in China (Millions)**

- 2003: 35%
- 2004: 14%
- 2005: 12%
- 2006: 27.3%
- 2007: 14%
Top 10 OEMs and production in 2006: (Units x 1000)

1. Shanghai GM  413
2. Shanghai Volkswagen  352
3. FAW Volkswagen  350
4. Chery Auto  300
5. Beijing Hyundai  280
6. Guangzhou Honda  260
7. Geely Auto  205
8. DongFeng Peugeot/Citroen  200
9. Brilliance Auto  200
10. Changan Ford/Mazda  194

60% Passenger Vehicles built in China
Major Locations and OEMs in China

**Beijing**
- Hyundai: 280K
- DCX: 100K
- Daimler: 20K

**TianJin**
- Toyota: 200K
- TJ XiaLi: 190K

**Wuhan**
- PSA: 200K
- Honda: 100K

**ChongQing**
- Ford: 190K
- Changan Auto: 500K

**ChangChun**
- VW: 350K
- FAW Auto: 150K

**Shanghai**
- GM: 400K
- VW: 350K
- ShAuto: 100K

**WuHu**
- Chery: 400K

**Guangzhou**
- Toyota: 200K
- Honda: 320K
- Nissan: 300K
China Automotive Market -
China Auto Market Needs for Composite -

- Lower System Costs
- Lower Part Weight
- Available Locally
  - Materials
  - Converters
- Recyclable Applications
- Design Freedom
Key Elements to be successful in China

1. Technology & Local Support
2. Engineering Capability in the Region
3. “Relationship” / Partnerships with OEM’s
4. Sales & Service
5. “Flexibility”
Thank You SPE and theAttendees of the 2007
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