Non Aerospace Demand: Trends and Forecasting

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Agenda

Global Market

Applications

Regions

Outlook
Global Market
Global Market, TIMET Perspective

Long Term Market View

2016 Global Market Split

0 20 40 60 80 100 120 140 160 180

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Source: Internal TIMET estimates
Mill Product Shipments by Market

Excluding Commercial Aero

Long Term Market View

Global Market Split

Emerging, 5%
Military, 15%
General Industrial, 80%

Source: Internal TIMET estimates
Industrial/Emerging Markets

Source: Internal TIMET estimates
Applications
Power Generation

• The main volume for PowerGen has traditionally been driven by nuclear plants

• Shift to investment in renewable energy sources in the future could impact titanium demand

Source: Internal TIMET sources, UNITI Miami 2017
Chemical Processing

• Corrosion resistance is main driving force
• Titanium has been integral part of CPI since early 1960s
• CPI is viewed as a strong source of titanium growth in the future

Source: Internal TIMET sources, UNITI Miami 2017, WSJ June 25 2017 (Census Bureau), American Chemistry Council
Desalination

- Two competing desalination technologies
  - Reverse Osmosis (RO)
  - Thermal
    - Desal infrastructure demand most critical in Saudi Arabia
    - Major projects moving out to 2020: 2000 MT pushed out

Source: Internal TIMET sources, UNITI Miami 2017
Oil & Gas

- Limited applications mostly due to cost
- Niche in deep floating components
- Forecasted to rise 20% from a historical low level, similar to 2016’s projection
- Recovery continues to be pushed out

Source: Internal TIMET sources, UNITI Miami 2017
Military Non-Aero

- Naval Vessels
- Body Armor
- Vehicular Armor
- Munitions Programs

Source: Internal TIMET sources, UNITI Miami 2017
Emerging Markets

• These markets are expected to remain active at 5% of the overall non-aero forecast
  • Mining
  • Automotive
  • Architecture

Source: Internal TIMET estimates
Supply Regions
Global Industrial/Emerging Market by Region

Source: Internal TIMET estimates
Mill Product Shipments by Region

Excluding Commercial Aero

Domestic: China & Russia

Rest of World

Source: Internal TIMET estimates
Chinese Titanium Market

China 2016 Applications
- Chemical Industry, 42%
- Aviation, 19%
- Power, 13%
- Sport, 5%
- Metallurgical, 4%
- Ocean, 3%
- Medical, 4%
- Salt Production, 3%
- Others, 5%

Chinese Domestic Industrial Market

Source: China Titanium Association
Chinese Product Forms

Chinese Market Product Mix

- Flats, 54%
- Bar, 22%
- Tube, 14%
- Forgings, 6%
- Castings, 1%
- Wire, 0%
- Other, 1%

Source: China Titanium Association
Russian Titanium Market

Domestic Russian Market Ti Demand, 2016

- Industrial, 45%
- Aircraft, 30%
- Engine, 25%

Russian Domestic Industrial Market, 2016

- General Industrial, 1800 MT
- Shipbuilding, 2000 MT
- Nuclear, 700 MT

Russian Domestic Industrial Market

- 2011: 3
- 2012: 2
- 2013: 5
- 2014: 7
- 2015: 8
- 2016: 5

Source: VSMPO Miami 2017 and TIMET internal estimates
Russian Applications

- Shipbuilding
- Nuclear Power
- Chemical
- Nonferrous
- Equipment
- Oil and Gas

Source: VSMPO Miami 2017, nationalinterest.org, Offshore Energy
Japanese Industrial Market

Japan Industrial Market Shipments

Japan 2016 Applications

- Power Generation: 19%
- Desalination: 18%
- PHE: 20%
- Electrolysis: 9%
- Traders: 10%
- Automobile: 5%
- Aircraft: 9%
- Medical: 2%
- Energy: 0%
- Sports Leisure: 1%
- Civil Engineering: 4%
- Consumer Goods: 4%
- Others: 1%

Source: JTS

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Japanese Product Forms

JTS Product Mix

- Welded Tube: 14%
- Cold Rolled Cut: 21%
- Cold Rolled Coil: 49%
- Hot Rolled: 5%
- Billet, Bar: 6%
- Other: 5%
Rest of World

Rest of World Shipments

Source: TIMET internal estimates
Outlook
Mill Product Shipments by Market

Excluding Commercial Aero

Long Term Market View

Source: Internal TIMET estimates

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