Titanium Demands and Trends in the Defense Market

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Titanium’s History in Defense


SR71  F-4  Stilleto  CH53K  C-130  HMMWV  F-117  Bradley  C-17  Stryker  F-22  F-35  Howitzer  A400M  Next Gen

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Global Defense Megatrends

- Defense Budget Growth
- Near-Peer Competition
- Regional Instability
- Persistent Terror Threat
- Growing Trade Tensions
Recent Defense Spending

Information obtained from public sources including the US Defense Budgets, SIPRI, ISH Jane’s, Deloitte and NATO Secretary General’s Annual Reports.
Global Defense Aircraft Trends

- Cargo Transport
- Fighter
- Special Purpose
- Trainer
- Trainer Light Attack

- Next generation fighter aircraft production rates increase
- Legacy fighter aircraft maintain backlogs
- Trainer aircraft demand continues in multiple regions
- Cargo and special purpose remain stable

Source: Forecast International
Top 10 Defense Fixed Wing Aircraft Manufacturers

Source: Forecast International

Annual Aircraft Units Produced, 2018 Estimate
Titanium Demand for Fixed Wing Aircraft

2017-2022 CAGR Est. 2.4%

Source: Forecast International
Other Uses for Titanium--Land and Maritime

**Ground Vehicles**

- Weight challenges in manned vehicle design are unsustainable, driving increased usage of Titanium in ground vehicles

**Maritime**

- Limited growth from renewed naval construction
- Acquisition cost outweighs life cycle cost savings—initial acquisition cost and reliance on mature ship designs are barriers to Titanium adoption
Titanium Usage Threats and Opportunities

- Additive Manufacturing
- Composites
- New Titanium Alloys
Summary

• Geopolitical uncertainty continues to influence defense spending
• Titanium demand is picking up based on strong defense budgeting around the globe
• Concerns over tariffs and sanctions continue to effect defense buying decisions
• New defense platforms such as the new bomber, trainer and continued demand for fighters is driving year over year growth