Airbus Titanium sourcing
International Titanium Association – October 2018

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An Airbus takes off or lands every 1.4 seconds.

- **18,812** Aircraft sold
- **11,397** Delivered
- **25,000+** Daily flights
- **134,000+** Total workforce
- **€1,060 billion** Order book
- **€67 billion** Annual revenue
Industrial ramp-up: 2018 deliveries & milestones status

<table>
<thead>
<tr>
<th>DELIVERIES</th>
<th>2018 AUGUST</th>
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<tbody>
<tr>
<td>A320</td>
<td>349</td>
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<tr>
<td>A330</td>
<td>27</td>
</tr>
<tr>
<td>A350</td>
<td>51</td>
</tr>
<tr>
<td>A380</td>
<td>7</td>
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<tr>
<td>TOTAL</td>
<td>434</td>
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MILESTONES 2018
- A350-900 ULR EIS
- A330 NEO EIS
- A220
5.3 $US Trillion market forecasted for the 20Y demand worldwide

Source: Airbus GMF 2017
Airbus backlog brings long term visibility

1- AIRBUS brings a strong backlog, giving long term visibility

2- AIRBUS continuously invests to keep its aircraft at competitive edge

3- AIRBUS masters aircraft developments

7,415

Total order backlog

A320  6,318
A330  298
A350 XWB  697
A380  102
Airbus Strategic & Procurement Business Priorities 2018/2022

- Industrial Performance
- Airbus Transformation
- Product Evolution
- Support and Services

- Rate Evolution
- Delivery Performance
- Development Milestones
- Cost
- Innovation & Digitalization
- Services
- Compliance
Airbus Global Supply Chain Titanium demand

- Airbus production rate increase + new aircraft designs such as A350XWB and A320neo (Ti Pylon) doubled Titanium demand over the decade. Beyond 2020, the Titanium demand is forecasted stable.

- The massive introduction of Titanium (18x more Titanium on A350XWB vs A330) is creating cost challenges on Aerostuctures that will be addressed from 2019/20 through competitiveness challenges and “Buy to Fly” optimization.

- End 2018, Airbus will launch the call for tenders for its next 10 years Titanium Raw Materials sourcing which will shape its Supply base and sourcing strategy for the next decade.

- Massive introduction of Ti over last decade is calling for cost optimization.
- Airbus will re-source its full Ti demand for the next decade.
What is the value generated by Materials & Structures on an new Aircraft?

- Aircraft innovation = customer value + industrial value
- The metal value chain shall innovate in terms of products and industrial models to increase its industrial value proposition
Competition between Materials

- The long term attractiveness of the Aerospace industry is creating an environment with increasing competition at each layer of the value chain.

- The most recent programmes developments and entry into service confirmed the competition among materials calling for an E2E transformation of the fragmented metal value chain.

- The metal industry need to innovate all along its industrial value chain to remove the current waste (Buy to Fly ratio) and to develop the metallic products of tomorrow for Airbus programmes incremental developments & future aircrafts.

The Titanium value chain, (as the overall metal) shall significantly improve its “Buy to Fly” ratio to remain the material of choice on Airbus incremental developments and future new products.
Introduction of new materials into new Aircraft but also into major evolutions?
Airbus continues investing on Additive Manufacturing

Airbus is actively developing the additive technology
- Additive is a potential game changer on hard metal technologies
- Value creation opportunities over entire aircraft lifecycle (proto, serial, spares…)

Step by step introduction on serial parts
- Qualification in front of Aeronautical requirements is challenging
- Low industrial maturity is THE current limiting factor competitiveness

We are at the early days of additive in Aeronautics serial production calling for a joint effort of all value chain actors
Geopolitical uncertainty vs Long term partnership

- Some geopolitical challenges might influence our sourcing policies but…

- Airbus aims at long term partnerships with its material suppliers since the Aerospace industry is a long term investment industry as the metal industry.

- Airbus is launching end 2018 the process to select itsTitanium partners for the next decade.
Thank you