Master Alloys – Getting ready for takeoff!

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Agenda

• Current Master Alloy Status
• Master Alloy Demand vs. Titanium Demand
• New Flavors of Al-V
• Trends of Other Standard Master Alloys
• Capacity
• Challenges
The Turnaround

• Master Alloy consumption bottomed out in Q3 2009

• Low expectations going into 2010
  - Slow economy  - Inventory buildup  - Effects of ‘08 / falling metal prices

• Q1 2010 first indications of an upturn
  - Increased spot orders  - Demand for full range of alloys for engines
  - However, still a conservative outlook for 2H 2010

• Q3 2010 Demand is back
  - High demand for Master Alloys, especially Al-V
  - Initial challenges for master alloy suppliers
    * Limited inventory  * Long rehiring/retraining curve
    * Safety/Quality: no compromise
Although Aerospace build rates may decline, Ti Alloy demand is expected to double over the next 5 years with the launch of titanium-intensive aircraft.
Total master alloy demand will be driven by commercial and military aerospace titanium demand.

Master Alloy demand is also highly dependent on Ti Mill % scrap usage.
New Flavors of Al-V

• Pre-2005 product mix dominated by 65V and 85V master alloys

• Last 5 years 75V with Hi N and/or Hi C has become a standard master alloy
  – Hi N = above 0.6% nitrogen
  – Hi C = above 0.6% carbon
  – Hi N & C = 0.25-1.5% each

• 60Al-40V as a powder application
Other Master Alloys

Multi Component Master Alloys

- Ti-17 (Al-Cr-Mo-Sn-Zr-Ti)
- Ti-6242 & Ti-6246 (Al-Mo-Sn-Zr)
- Al-Mo-V
- Al-C-Ti

Binary Master Alloys

- Al-Mo
- Al-Cr
- Al-Nb
- Ni-V
- Al-Si
- Al-Co
- Si-Ti
- Mo-Ti

Master alloys aren’t identical and their production processes and throughput can vary greatly. Mix has significant impact upon investment in capacity to produce and meet demand. In order to be ready, we need to understand future mix.
Sourcing Raw Materials

The key to a stable master alloy supply
Multiple Sources
Balance Delivery Time and Cost with Demand
Capacity

Investing in the future of Master Alloys
Master Alloy Challenges

• Safety/Quality – No compromise.

• Slave to the Steel Industry – Ferro alloys utilize many of the same raw materials. The cost of key raw materials of aerospace master alloys are driven by Ferro alloys.

• Capacity – Automation, Expansion, Raw Materials

• Aerospace Cycle – demand to double in 5 years? Will this be the case?