Global Titanium Inc.

- Detroit, Michigan
- Ferrotitanium
- Titanium Scrap
- Titanium Powder (~100 micron)
- ISO 9001 Registered
Discussion Agenda

- Global Steel Production and Titanium Use
- Status Quo Forecast for Titanium Demand in Steel
- Changing Structure of Automobile Production
- Potential Impacts for Titanium Demand
- Titanium Availability for Steel
- Conclusions
Global Steel Production 2014

Figures are in MT

Total = 1,649,303,000 MT

Source: World Steel Association
Key Drivers for Titanium in Steel

- Welded pipe
- Approximately 15% of welded pipe utilizes titanium
- Ti content is roughly 0.13%
- Market dramatically reduced in 2015 due to global oversupply of oil
- Global Rig Count down by 39% since September 2014

1 Baker Hughes Rig Count Report
Global Oil Market

Sources: Baker Hughes and Brent Crude Spot Price
Key Drivers for Titanium in Steel

- Ultra low carbon steel
- Some use in AHSS
- Use driven by process technology – die life and formability
- Ti content is roughly 0.13%
- Roughly 80% of titanium use in steel is attributable to automobiles and appliances
Titanium Addition Types for Steel

- **Produced from titanium scrap**
- **Melted with iron in an induction furnace**
- **Mostly variable cost that fluctuates with the market**

- **Produced from illmenite, aluminum & steel scrap, lime, & fluorspar**
- **Manufactured via aluminothermic reaction**
- **Mostly fixed cost that cannot compete at lower prices**

- **By-product of titanium sponge for aerospace**
- **Highly variable chemistry**
- **Availability varies with sponge production**
Titanium Requirements for Steel 2014

Total = 73,684 MT

Figures are in MT of titanium contained
Auto Production Forecast

Developed Regions

Developing Regions

Source: IHS Global Insight
2007 Vehicle Composition

- Aluminum & Magnesium: 0.80%
- Mild Steel: 22.40%
- Advanced HSS: 9.50%
- Conventional HSS: 12.70%
- Bake Hardenable & Medium HSS: 54.60%

2015 Vehicle Composition

- Aluminum & Magnesium: 2.50%
- Mild Steel: 29%
- Advanced HSS: 34.80%
- Conventional HSS: 10.20%
- Bake Hardenable & Medium HSS: 23.50%

Source: Ducker Worldwide
Automakers Have More To Do

- Fuel efficiency standards have increased approximately 30% since 2007

- And compliance is 52% in 2015.¹

- However, between 2015 and 2025, fuel efficiency standards are slated to increase by 51%.

- There is still a long way to go

¹ Consumer Federation of America 2015 study
How will automakers respond?

Survey of Automakers Preferences on Fuel Efficiency Standards

- **Lightweighting**: 49%
- **Engine Efficiency**: 39%
- **Electric Vehicles**: 26%
- **Diesel Engines**: 13%
- **Downsizing Vehicles**: 11%
- **Fuel Cells**: 10%
- **Bio-Fuel**: 7%
- **Solar and other types of power**: 3%
- **Other**: 15%

Source: Wards Auto, DuPont Automotive Trends Benchmark Study, conducted by Penton Research
Future Vehicle Composition

2015 Vehicle Composition
- Aluminum & Magnesium: 29%
- Mild Steel: 2.50%
- Advanced HSS: 34.80%
- Conventional HSS: 10.20%
- Bake Hardenable & Medium HSS: 23.50%

2025 Vehicle Composition
- Aluminum & Magnesium: 8.0%
- Mild Steel: 15.0%
- Advanced HSS: 48.5%
- Conventional HSS: 7.5%
- Bake Hardenable & Medium HSS: 20.0%
- Carbon Fiber: 1.0%

1 This is an estimate based on change history to date.
Forecast of Titanium Demand for Steel
Supply Assumptions

- Growth in mill products of 4% annually
- Buy-to-Fly ratio of 5 to 1
- Sponge capacity utilization growth from 58% in 2014 to 68% in 2022
- Global Sponge Capacity of 330,000 MT
- Off-grade sponge constant at 15%
- Global scrap utilization rates grow from 50% to 58% of ingot production by 2022
Titanium Availability for Steel

Status Quo Forecast  Reduction Forecast
Titanium Availability for Steel

Scrap
Status Quo Forecast
Reduction Forecast

Year:
- 2014
- 2015
- 2016
- 2017
- 2018
- 2019
- 2020
- 2021
- 2022

Values:
- Scrap: 60,000
- Status Quo Forecast: 80,000
- Reduction Forecast: 70,000
Published FeTi Pricing History

Source: CRU Ryan's Notes
Conclusions

• Ferrotitanium market will be well-supplied in the years ahead with a strong possibility for over-supply

• This should act to keep prices for off-grade scrap and ferrotitanium depressed.

• Innovation in the titanium industry could counter-balance this oversupply
  – Scrap utilization improvement
  – Improved buy-to-fly ratios
  – New market development