Commodity Spotlight: North American Steel Industry

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North American Steel Industry

- Globally Competitive
- Strategically Aligned: Defense, Economy
- Leader in Technology Deployment
- Investment in Market Development
- Sustainable/Environmentally Responsible
North American Steel Industry

**Integrated Mills**
- Basic Oxygen Furnace
- Iron Ore-Based
- Centralized
- Flat-Rolled Sheet

**Mini-Mills**
- Electric Arc Furnace
- Scrap-Based
- Regional
- Long, Heavy Shapes

AISI's member companies represent 75% of U.S. raw steel production.
North American Steel Mills
Steel-Consuming Markets

- Construction (40% - 45%)
- Autos (18% - 20%)
- All Others (15%)
- Industrial Equipment (15% - 18%)
- Energy (4%)
- Containers (4%)
- Appliances, Office Furniture (2.5%)
- Defense (<1%)

122 MT/Year Including 20% Imports

Source: C. Plummer, Metals Strategies Inc.
Steel Applications: National Security

I. Homeland Security
   • Transportation (Bridges, Roads, Airports, Rail)
   • Energy Distribution
   • Water Distribution
   • Public Health/Safety
   • Commerce

II. Military
   • Armored Vehicles
   • Ships/Aircraft
   • Weaponry/Projectiles and Other Ordnance
   • Logistical Support
Steel Applications: Major Defense Procurement

Abrams Tanks (M1) 22 tons each
Stryker Light Armored Vehicle 8 tons each
Bradley (M2) 6 tons each
Aircraft Carrier 50,000 tons each
Submarine (Trident) 10,000 tons each
LPD Amphibious Force Ship 12,000 tons each
Guided Missile Destroyers (DDG) 500 tons each
Steel Demand: Munitions

• Capabilities of Steel Producers in the U.S.
  – Rounds (≤ 9”), RCS (≤ 8”)

• Grades:
  – Mild Steel Grades: 1046, 1045
  – Alloy Grades: 4130, 4140, 4340, 4135
  – High Carbon Grades: HF-1, 52100

• Processing:
  – Tighter Tolerances
  – Improved Surface Qualities
  – Hot Forging
  – Spherodizing
Steel Investment: >$60 Billion since 1990

- Quality
- Productivity
- Cost
- Energy/Environment

Productivity: More Than Tripled Since 1980s
USA Steel Industry Labor Efficiency


USA Steel Mill Employment: 125,000
Steel Industry: Reduction in Energy Use

- 33% Less Energy Use Since 1990
- 19% Less Energy Use Since 2002
Steel Industry:
Environmentally Responsible

• Air and Water Emissions: 90% Reduction
• Kyoto Target: >7% GHG Reduction, 1990-2012
• Steel Scrap Recycled in U.S. in 2007: 78.2% (over 82 million tons, highest ever)
• www.sustainable-steel.org
Steel Technology and Manufacturing

- DoE R&D “Roadmaps”
- Material Properties (AHSS)
- Third-Generation Steels
- Coatings Technologies
- Competing Materials
Today’s Steel Products

- Durability, Strength, Composites
- Over 2,000 Steel Specifications
- Automotive = 50% New Products

![Steel Products Diagram](image-url)

- Mild Steels (<210MPa)
- High Strength Steels
- Ultra High Strength Steels (>550MPa)

Elongation (%) vs. Yield Strength (MPa)

Future Opportunity

Third Generation AHSS

Mild, IF, IS, BH, CMn, TRIP, HSLA, CP, MART
Steel Market Development Strategic Plan

- Competing Materials
- Protecting Investment
Objectives:
• Commercial-Based Tactical Truck
• Develop Near-Term, Low-Cost Fuel Economy/Environmental Technologies
• Achieve 25% Weight Reduction

IMPACT – U.S. Army (TACOM)

U.S. Army/Ford/AISI
Steel and Defense Industries Collaboration – High-Performance Steels

Transportation Infrastructure

Partnership - HPS for Bridges

- U.S. Navy
- FHWA
- AISI
Major Challenges Facing Steel Industry and DOD

- Cost of Raw Materials
- Access to Capital
- Mergers/Acquisitions
- Import Share/Surges
- Impact of China et al.
- Global Demand
- Exchange Rates
- Mil Specs/Technology/Procurement

Trade

Climate Change
Globalization of Steel Industry

- Foreign Investment/Ownership
- USA Mergers and Acquisitions
  - ArcelorMittal (Luxembourg)
  - Severstal (Russia)
  - Evraz (Russia)
  - SSAB (Sweden)
  - Gerdau Ameristeel (Brazil)
- Domestically Incorporated
- Regional Market Priority
Global Demand: Raw Materials

Cost Drivers Impacting Steel Prices

- Scrap (300%, China Demand)
- Coke (Import, W.V. Coal Mine)
- Iron Ore (China Demand)
- Energy Costs (78% Increase Since 2002)
Purchasing Magazine Transaction Price for Steel, Hot-Rolled Sheet, Midwest Market Average, $/Ton
January 1980 - December 2008
Steel and Defense Industries: Working Together

- National Defense
- Economic Stability
- Homeland Security
- Domestic Preference
- **Buy American**
  - Domestic Incentive
  - Production Disruption
  - Availability/“Kick Out Clause”
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