Alloy Steel Industry in India – An Overview
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Alloy Steel Business

STEEL

FLAT PRODUCTS
(HR Plates & Coils, CR Sheets & Coils)

LONG PRODUCTS

MILD STEEL, HIGH CARBON STEEL, CONSTRUCTION STEEL
(Wire Rods, Bars & Rounds, Angles & Channels, Rails, Beams)

STAINLESS & ALLOY STEEL
(Wire Rods, Bars & Rounds, Bright Bars, Wires)

Constitutes around 8% of Indian Steel Demand
Steel containing alloying elements like Chromium, Nickel, Molybdenum, Vanadium used in highly specialized applications in Automotive, Engineering, Railways & Defence sectors
Alloy Steel - Product Profile

**Grades:**
More than 400 varieties

**Products:**
Bars
Wire rods
Wires
Bright bars

**Sizes:**
Wide range varying from 3 mm to 250 mm

**Shapes:**
Rounds, Squares, Flats, Hexagons, Rectangles and Customized shapes
Alloy Steels are produced conforming to international specifications such as:

Japanese (JIS)  American (AISI/SAE)
German (DIN)    Russian (GOST)
Indian (BIS)    British (BS)

**SUPPLY CONDITION:**

- As rolled, forged
- Heat treated (*Annealing, Hardening, Tempering*),
- Cold finished, Smooth turned, Centreless Ground
Product Quality Parameters

**CHEMICAL**
- Main Elements Control
- Residual Element Control
- Sulphur Control
- Gas Control (O2, N2 & H2)

**METALLURGICAL**
- Grain Size
- Inclusion
- Microstructure
- Hardenability
- Response to heat treatment
- Machinability
- Macro Quality
- Upset Test

**MECHANICAL**
- Tensile
- Impact
- Fatigue

**PHYSICAL**
- Dimensional Quality
- Surface Defects
- Identification & Traceability
- Packaging
Variety of stringent destructive and non-destructive tests for Mechanical & Metallurgical Properties:

Tensile & Yield Strength
Hardness
Hardenability
Grain size
Blue Fracture Test
Macro streak flaw test
Micro-structure
Non metallic inclusions
Physical inspection

- Magnetic Particle Inspection
- Eddy Current Testing
- Ultrasonic Testing.
- Macro streak flaw testing
- Lead and Sulphur print testing
Requirements of alloy steels are in small batches ranging from 500 Kgs to 60 MT per grade.

Each Alloy steel grade is tailor-made as per customer specification, quantity requirements and end application.

It is not a commodity product.
MANUFACTURING PROCESS
ELECTRIC ARC FURNACE ROUTE
MINI BLAST FURNACE ROUTE
Mini Blast furnace

Sinter

Sinter Plant

Calibrated Iron Ore

Coal Injection

Coke Oven Plant

COKE

Off Gas Power Plant

Off Gas Power Plant

DRI

DRI PLANT

LF

VD

CASTER

ROLLING MILL

MBF ROUTE
Leading Alloy Steel Producers

KALYANI

USHA MARTIN

SUN FLAG STEEL

MUKAND

MAHINDRA

MODERN STEELS

VARDHMAN

ISMT LIMITED
Alloy Steel: Customer Profile
Alloy Steel: Customer Profile
Alloy Steel - End Applications

- Transmission parts
- Engine components
- Steering components
- High tensile fasteners
- Fuel injection pumps
- Bearings
- Braking system
- Suspension parts
- Wind Mill
Stainless Steel - End Applications

- Power Generation: 8%
- Oil & Gas: 13%
- Machine Shops: 12%
- Food Equipment: 7%
- Flow Control: 6%
- Fittings & Flanges: 6%
- Engine Valves: 3%
- Wire: 18%
- Process Equipment: 11%
- Fasteners: 8%
- Others: 8%
## MARKET DEMAND

Estimated requirement in India (‘000 MT)

<table>
<thead>
<tr>
<th>YEAR</th>
<th>ALLOY</th>
<th>STAINLESS STEEL</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010-11</td>
<td>3,800</td>
<td>1,200</td>
<td>5,000</td>
</tr>
<tr>
<td>2015-16</td>
<td>5,600</td>
<td>2,100</td>
<td>7,700</td>
</tr>
<tr>
<td>Growth</td>
<td>47 %</td>
<td>75 %</td>
<td>54 %</td>
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</tbody>
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Global Demand of **Alloy steel Long Product** is estimated at **125 Million tons**

**Indian Alloy Steel Industry has capacity of 8 Million Tons**
Opportunities

• India becoming a global hub for Automobile

• Growth in Indian Automobile and Auto component Exports

• Localization by major Global players

• Availability of Skilled labour at lower cost

• Investments in New Technologies and capacities
Indian Automobile Industry Scenario
Auto Investments & Their Spread

NEW HUB: Uttarakhand

WEST
- John Deere
- GM
- BMW
- Mahindra
- Fiat
- Renault
- Force
- Eicher
- Cummins
- Audi
- Volkswagen

NORTH
- Honda
- Suzuki
- TATA
- Hero Honda
- Eicher
- LML
- New Holland

EAST
- Tata
- HM
- Cummins

SOUTH
- Hyundai
- Ford
- Volvo
- Same Deutz-Fahr
- Royal Enfield
- Ashok Leyland
- Hindustan Motors
- TVS

Large number of Indian & Global OEMs across the country
Automobile Growth Projection

PV: 9 Million by 2020
2W: 30 Million by 2020
Sr. No. | Product Mix                                      | Quantity in TPA |
---------|-------------------------------------------------|-----------------|
         | Carbon and Alloy Steel, Wire Rod and Bar Products | 850,000         |

Note: 850,000 TPA Product Mix includes Finishing Facilities i.e. Hot Blasting, Annealing, Drawing Equipment, Inspection Equipment for 150,000 TPA

Auto component production in India likely to go up to US $ 110 Billion by 2020

Source: ACMA - EY Vision 2020
Rising expectation from Automobile Customers

• Light Weight
• Fuel efficient
• Safety
• Reduced Noise levels
• Greater Life
• Reliability

• Consistent Quality
• Cost Competitiveness
• Quick Deliveries
• Flexibility to cater to fast changing Market Demand
• Localization of steel
Alloy Steel: Initiatives to meet the expectations

- Improve Cleanliness of steel w.r.t Gas and Nonmetallic Inclusions
- Development of Micro alloyed Steels - elimination of Heat treatment at component stage
- Close Chemistry control with narrow band Hardenability
- Investments in New Technology and latest Inspection and Testing facilities
- Improve process efficiency w.r.t yields, energy, rejections, raw material consumption
- New Product development - Import substitution
Challenges faced by the Alloy Steel Industries

- Sluggish Domestic and Global Demand

- Availability and Price of Iron Ore - Closure of mines in Karnataka since August 2011

- Threat from cheap imports due to slow down in Global economy and surplus capacities

- Availability and cost of Power

- Higher financing costs impacting production costs and new investments
Challenges faced by the Alloy Steel Industries

• Economy of Scale: Fragmented Industry with large number of players with small capacities: Higher Production costs

• Lower Capacity Utilization

• Price realization not commensurate with rising production costs

• Basic Customs duty of 5% only (commodity flat product is 7.5%) Not providing adequate protection to the Domestic Industry, which is dependent on Inputs at Administered Prices
Alloy steel Industry with new investments in Technology, Capacity, and Quality assurance is fully geared up to meet the demands of customer’s in the Domestic & Global market.
THANK YOU