

# ***Steelmaking, Shaping, Treating and processing***

**Steel and Steel Products**

***(Fasteners, Seamless Tubes, Casting,  
Rolling of Flat Products & others)***

**Iron and Steel making by-Products, Steel  
making and Refining, Manufacturing of Steel,  
Steel Production**

# Introduction

Steel is one of the most important and widely used products in the world. Currently, the steel industry is undergoing a process of change. As a result of ongoing technical and economic developments, the production and use of electric arc furnace steel is, beneath the steel production in a blast furnace, becoming increasingly important, continuously gaining share of world-wide steel production over the past 30 years. Steel is a term given to alloys containing a high proportion of iron with some carbon. Other alloying elements may also be present in varying proportions.

The properties of steel are highly dependent on the proportions of alloying elements, so that their levels are closely controlled during its manufacture. The properties of steel also depend on the heat treatment of the metal.

The comparative advantage of cheap and high quality iron ore and manganese, has been somewhat set off by the limited accessibility of the steel industry to the supply of coking coal. The adoption of the sponge iron route by the private sector integrated plants helped in circumventing the constraint, and at the same time, ushered in a technological revolution in the industry. As a result, India has come to enjoy a cost advantage compared to most countries.

Not impressed by the Tenth Plan target of 38 mn tonnes (which was lower than 39 mn tonnes of the Ninth Plan), the Government of India had announced a new National Steel Policy in 2005. The policy aimed at achieving a production level of 110 mn tonnes in 2019-20, of which the domestic consumption was aimed to rise to 90 mn tonnes and exports to 26 mn tonnes. The industry was expected to register a CAGR of 7.3%, slightly higher than the 7% annual growth registered during the 15-year period ending 2004-05. According to a study carried out by the International Iron and Steel Institute, the demand in India is projected to a level of 180 mn tonnes by 2020.

Iron and steel have played a leading role in the development of human civilization and their techniques. Together with its derivative, steel, iron has no real rival in its particular fields of application and has become a synonym of progress, being an essential element in mankind's greatest technological achievements. It was at the origin of the industrial and scientific revolutions and at the heart of all the great discoveries which have marked the history of humanity from the manufacture of high quality swords in ancient times to today's architectural wonders. Steel is an alloy that consists mostly of iron and has carbon content between 0.2% and 2.1% by weight, depending on the grade.

Carbon is the most common alloying material for iron, but various other alloying elements are used, such as manganese, chromium, vanadium, and tungsten. Rolling is a metal forming process in which metal stock is passed through a pair of rolls. Rolling is classified according to the temperature of the metal rolled. Steelmaking is the second step in producing steel from iron ore. Processing of steel results in special steel product with required properties, for example; vacuum treated steel for forging ingots; pre strengthened stress relieved elongated steel, metallurgical addition product, forging powder alloy steels, etc. Fasteners are used to join and hold two or more pieces of metal either temporarily or more pieces of metal either temporarily or permanently.

Some of the most common are bolts, screws, nuts, rivets and pins. Packaging steels differ from other sheet products particularly in terms of their thickness, mechanical properties and coatings, together with their aptitude to satisfy specific industrial and marketing requirements related to high production rates, design factors etc. Small gage welded tubes have an extremely wide range of applications, including metallic roof frames, mechanical construction in public work and industrial engineering sector, agricultural machinery, fluid distribution circuits, piston, etc. India is among the top producers of all forms of steel in the world. Easy availability of low cost manpower and presence of abundant reserves make India competitive in the global setup.

The steel industry in India has witnessed an increase in demand due to expanding oil and gas sector, huge spending on infrastructural facilities coupled with growth in housing, consumer durables and auto sectors.

This book basically deals with structural changes in steel during hot rolling, structural changes during reheating, kinds of grain restoration process, dynamic restoration process, static restoration process, effect of initial grain, size of static re crystallization, effects of temperature and micro alloying, fundamental principles of the metal rolling process, preparing and heating the initial materials, preparations for rolling heating before rolling operations, bolt and nut manufacturing technology, casting of steel for flat products etc.

The present book covers different important aspects of steel processing with the casting method of steel for flat products, rolling of rails, wheels and rings, rolling of different steel products, production of fasteners, welded pipes, steel products for the building trade and many more.

The book is very useful for everybody who wants the thorough study on steel and steel products or wants to diversify in to this field.

# Table of Contents

## 1. Structural Changes in Steel during Hot Rolling

Structural Changes during Reheating

Kinds of Grain Restoration Process

Dynamic Restoration Process

Static Restoration Process

Effect of Initial Grain Size of Static Recrystallization

Effects of Temperature and Microalloying

Effect of Amount of Deformation

Factors Affecting Critical Reduction for  
Recrystallization

Grain Growth after Deformation

**Structural Changes in Steel during Cooling**

**Effect of Steel Structure on Flow Stress**

## **2. Fundamental Principles of the Metal Rolling Process**

## **3. Steels for Magnetic Applications**

**Electrical Steels-Metallurgy and Properties**

**Introduction**

**Utilization and Property Requirements**

**Optimization of Magnetic Properties**

**Type of Electrical Steel**

**Classification**

**Steel Grades**

**Market Segmentation**

**Conclusions**

## **4. Preparing and Heating the Initial Materials**

**Preparations for Rolling**

**Heating before Rolling Operations**

## **5. Hot Seamless Tube Rolling Processes**

**Elements of Skew Rolling Theory**

**Tube Rolling in Plug Mill Type Seamless Tube Mills**

**Tube Rolling in Continuous Seamless Tube Mills**

**Tube Rolling in Three-Roll Mills**

**Tube Rolling in Pilger Mills**

**Seamless Tube Production by the Extrusion Process**

**Seamless Tube Finishing Operations**

## **6. Bolt and Nut Manufacturing Technology**

**Introduction**

**Fundamentals of Mechanically Working and Cutting Metals**

**(a) Cold Forming**

**(b) Hot Forging**

**(c) Metal Cutting**

**Manufacturing Technologies**

**(a) Cold Forming of Bolts**

**(b) Cold Forming of Nuts**

**(c) Hot Forging of Bolts**

**(d) Hot Forging of Nuts**

**(e) Machining of Bolts and Nuts from Hexagon Bar**

**Steel Pre-Processing**

**(a) Steel Making**

**(b) Surface Treatments and Wire Drawing**

**Fastener Steels and Heat Treatments**

**(a) Alloying Elements**

**(b) Heat Treatments**

**Finishing Operations**

## **7. Casting of Steel for Flat Products**

**Type of Cast Products**

**Casting of Ingot**

**Types of Ingots**

**Methods of Continuous Casting of Thick Slabs**

**Continuous Casting of Thick Slabs**

**Slab Width Control**

**Continuous Casting of Thin Slabs and Strip**

**Requirements for Continuously Cast Steels**

**Oxide Inclusions in Concast Steel**

**Formation of Oxide Phases**

**Influence of Caster Type on Steel Quality**

## **8. The Rolling of Rails, Wheels and Rings**

**Introduction**

**Early Types of Rails and their Production**

**The Evolution for the Rail Mill**

**Modern Rail Mills**

**Rail Joints and their Manufacture**

**The Forging and Rolling of Wheels**

**Ring Rolling**

## **9. Mill Automation for the Rolling of Flat Products**

**Automation of Flying Shear Operation in a Continuous**

**Hot-Rolling Mill**

**Automation of Coiler Operation for Hot Strip**

**Automation of Strip Measuring Gauges for Hot Rolling**

**Automation of Continuous Pickle Line Operation**

**Automation of Strip Thickness Gauges for Cold Reduction**

**Automation of Strip Thickness Control by the Screw-  
Down Gear**

## **10. General Steelmaking Processes**

**Welding Material for Super Low Temperature Steels**

**Refining Steel by Blowing Oxygen Beneath the Surface**

**Cold Reduced Aluminum Stabilized Steel having High  
Drawability**

**Sulfide Modification of Steel**

**Steel Sheets having Excellent Enamelability**

**Liquid Sintering with Titanium Alloys**

**Liquid-Solid Alloys for Casting**

**Rimmed Unkilled Enamelling Steel**

**Producing an Enamelling Steel Sheet**

**Deep Drawable Deoxidized Steel**

**Alloying Steel with Highly Reactive Materials**

**Prevention of Surface Cracking during Steel Reheating**

**Prestrengthened Stress Relieved Elongated Steel**

**Vacuum Treated Steel for Forging Ingots**

**Metallurgical Addition Product**

**Uncropped, Unworked, Elongated Leaded Steel Casting**

**Adding Alloys to Steel**

**Production of Low Carbon Ferroalloys**

**Forging Powder Alloy Steels**

**Production of Leaded Steel**

**Low Carbon Ferrochromium**

**High Explosive Fragmentation Munition**

## **11. Varnishing and Printing of Packaging Steels**

**Introduction**

**General Aspects of Organic Coatings used for**

**Varnishing and Printing**

**Definition**

**Types of Organic Coating**

**Organic Coating Constituents**

**Application and Curing of Organic Coatings**

**Application with Roller Varnishing Machines**

**Curing**

**Other Application Techniques**

**Inspection Methods**

**Printing and Decoration of Metallic Packaging**

**Conclusions**

## **12. Phase Transformation in Steel**

**Phase Diagram**

## **Constituents in Steels**

**Austenite**

**Ferrite**

**Graphite**

**Cementite**

**Eutectoid**

**Pearlite**

**Eutectic**

**Ledeburite**

**Transformation Temperature**

**Phases in Hypoeutectoid Steel**

**Phases in Eutectoid Steel**

**Phases in Hypereutectoid Steel**

**Phase Transformation Hysteresis**

**Supercooling or Austenite**

**Bainite**

**Martensite**

**Isothermal Transformation Diagram**

**Continuous-Cooling Transformation Diagram**

## **13. Optimization and Modernization of Hot Strip**

**Mills**

**Main Strategy in Optimization of Rolling Process**

**Metallurgical Requirements**

**Energy Consumption Requirements**

**Yield Requirements**

**Product Quality Requirements**

**Analysis of Temperature Conditions in Hot Strip Mill**

**Methods of Optimizing Temperature Conditions**

**Optimizing Operating Parameters**

**Close Coupling of Continuous Rougher with Finishing Mill**

**Close Coupling of a Reversing Rougher with Finishing Mill**

**Combining a Reversing Rougher with Finishing Mill**

**Coilbox**

**Intermediate Steckel Mill**

**Reradiating Thermal Cover System**

**Main Objectives in Modernization of Hot Strip Mill**

**Requirements for the Evaluation Models**

**Evaluation of the Solutions for Mill Modernization**

## **14. Low Carbon Constructional Alloy Steels**

**Low Temperature High Strength Tough Steel**

**Alloy Steel for Arctic Service**

**High Strength Cold Rolled Steel with High Press Formability**

**Production of High Strength Cold Rolled Steel Sheet**

**Low Alloy Steel for Low Temperature Services**

**Full Continuous Annealing Process**

**High Strength Killed Wire Rods and Bars**

**High Formability High Strength Steel**

**High-Strength Cold-Workable Ti Added AL Killed Steel**

**Improving Strength and Toughness by Controlled Cooling**

**High Strength Notch Tough Steel**

**Hot Rolled High Strength Low Alloy Steel**

**Preparation of Hot Rolled Niobium Structural Steel**

**Hot Rolled Flat Steel for Cryogenic Service**

**High Strength Structural Steel with Good Weldability**

## **15. Hot Rolling of Plate, Sheet and Strip**

**Types and Sizes**

**Initial Materials and Reheating them for Rolling**

**Hot Rolling Sheet and Plate Mills**

**Hot Rolling Processes for Plate and Sheet in Various**

**Types of Mills**

**Rolling Steel Strip in a Planetary Mill**

**Finishing of Hot-Rolled Flat Products**

## **16. Rolling of Section Steel, Bars and Rods**

**Types and Sizes**

**Initial Materials and Reheating them for Rolling**

**Section Mills**

**Rod Mills**

**Strip Mills**

**Roll Pass Design for the Rolling of Rounds**  
**Roll Pass Design for the Rolling of Squares**  
**Roll Pass Design for the Rolling of Flats and Strip**  
**Roll Pass Design for the Rolling of Angles**  
**Finishing Operations on Bars and Rods**

## **17. Modern Rolling Plant**

**Mills for the Continuous Rolling of Wide Strip**  
**Modern Plant for the Rolling of Non-ferrous Material**  
**Copper and Copper Alloys**  
**Nickel and Nickel Alloys**  
**Aluminium and Aluminium Alloys**

## **18. Metal Fasteners**

**Machine Bolts**

**Cap Screws**

**Machine Screws**

**Set Screws**

**Thread-forming Screws**

**Stove Bolts**

**Carriage Bolts**

**Stud Bolts**

**Nuts**

**Castle Nuts**

**Jam Nuts**

**Cap or Acorn Nuts**

**Wing Nut**

**Washers**

**Rivets**

**Machine Pins**

## **19. Production of Welded Pipe**

**Continuous Furnace Butt-Welded Pipe Manufacturing Processes**

**Electric Resistance Welded Pipe and Tubing Production**

**High Frequency Electric Resistance Welding in Pipe and Tubing  
Production**

**Submerged-Arc Welded Pipe and Tubing Production**

**Production of Submerged-Arc Welded Straight-Seam Pipe**

**Production of Submerged-Arc Welded Helical-Seam Pipe**

**Other Welded Pipe Production Methods**

**Inert-Gas Metal-Arc Welding of Pipe**

**Induction Welding of Pipe and Tubing**

## **20. Sheet Forming for Packaging Applications**

**Drawing of Packaging Steels**

**Specific Aspects of Packaging Steels**

**Characterization of Packaging Steels**

**Parameters Affecting Drawing Behavior**

**Example Applications**

**Drawing and Wall Ironing of Packaging Steel**

**Preliminary Drawing**

**Wall Ironing**

**Necking and Flanging**

**Full Operture Easy-Open Can Ends**

**Score Line Profile (Tool Geometry and Residual Thickness)**

**Score Line Shape in the Plane of the LID**

**End Profiles**

**Steel Grades**

**Can End Seaming**

**Principle of Double Seaming**

**Seaming Tools**

## **21. Mill Automation for Pipe and Tubing Production**

## **22. Steels for Small Gage Welded Tubes**

**The Small Gage Welded Tube Market**

**Manufacturing Processes**

**Steel Products used in the Manufacture of SWTs**

**Major Property Requirements**

**Conditions to be Met in SWT Manufacture**

**Geometry Control**

**Principal Grades Employed**

## **23. Steel Products for the Building Trade**

**Statutory Requirements**

**Building Steels and their Coatings**

**Steel Selection**

**Galvanized Steels**

**Coil Coated Steels**

**The New Solissime Range**

**Coating Selection Guide**

**Utilization and Maintenance Precautions**

**Additional Products**

**Condensation-proof Coatings**

**Acoustic Insulation**

**Thermal Insulation**

**Solconfort Sandwich Sheets**

**Isofran Sandwich Sheets**

**Typical Applications**

**Walling and Roofing**

**Facing Systems**

**Flooring**

**Conclusions**

**Niir Project Consultancy Services (NPCS)**  
**can provide Process Technology Book on**  
**Steel and Steel Products**  
*(Fasteners, Seamless Tubes, Casting, Rolling  
of Flat Products & others)*

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# ***Niir PROJECT CONSULTANCY SERVICES***

An ISO 9001:2008 Company

# Who are we?

- *One of the leading reliable names in industrial world for providing the most comprehensive technical consulting services*
- *We adopt a systematic approach to provide the strong fundamental support needed for the effective delivery of services to our Clients' in India & abroad*

# What do we offer?

- *Project Identification*
- *Detailed Project Reports/Pre-feasibility Reports*
- *Business Plan*
- *Industry Trends*
- *Market Research Reports*
- *Technology Books and Directory*
- *Databases on CD-ROM*
- *Laboratory Testing Services*
- *Turnkey Project Consultancy/Solutions*
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# How are we different ?

- *We have two decades long experience in project consultancy and market research field*
- *We empower our customers with the prerequisite know-how to take sound business decisions*
- *We help catalyze business growth by providing distinctive and profound market analysis*
- *We serve a wide array of customers , from individual entrepreneurs to Corporations and Foreign Investors*
- *We use authentic & reliable sources to ensure business precision*

# Our Approach

**Requirement collection**

**Thorough analysis of the project**

**Economic feasibility study of the Project**

**Market potential survey/research**

**Report Compilation**

# Who do we serve?

- *Public-sector Companies*
- *Corporates*
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- *NRI's*
- *Foreign Investors*
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- *Embassies & Consulates*
- *Consultancies*
- *Industry / trade associations*

# Sectors We Cover

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- *Adhesives, Industrial Adhesive, Sealants, Glues, Gum & Resin*
- *Activated Carbon & Activated Charcoal*
- *Aluminium And Aluminium Extrusion Profiles & Sections,*
- *Bio-fertilizers And Biotechnology*
- *Breakfast Snacks And Cereal Food*
- *Bicycle Tyres & Tubes, Bicycle Parts, Bicycle Assembling*

- *Bamboo And Cane Based Projects*
- *Building Materials And Construction Projects*
- *Biodegradable & Bioplastic Based Projects*
- *Chemicals (Organic And Inorganic)*
- *Confectionery, Bakery/Baking And Other Food*
- *Cereal Processing*
- *Coconut And Coconut Based Products*
- *Cold Storage For Fruits & Vegetables*
- *Coal & Coal Byproduct*

- *Copper & Copper Based Projects*
- *Dairy/Milk Processing*
- *Disinfectants, Pesticides, Insecticides, Mosquito Repellents,*
- *Electrical, Electronic And Computer based Projects*
- *Essential Oils, Oils & Fats And Allied*
- *Engineering Goods*
- *Fibre Glass & Float Glass*
- *Fast Moving Consumer Goods*
- *Food, Bakery, Agro Processing*

- *Fruits & Vegetables Processing*
- *Ferro Alloys Based Projects*
- *Fertilizers & Biofertilizers*
- *Ginger & Ginger Based Projects*
- *Herbs And Medicinal Cultivation And Jatropha (Biofuel)*
- *Hotel & Hospitability Projects*
- *Hospital Based Projects*
- *Herbal Based Projects*
- *Inks, Stationery And Export Industries*

- *Infrastructure Projects*
- *Jute & Jute Based Products*
- *Leather And Leather Based Projects*
- *Leisure & Entertainment Based Projects*
- *Livestock Farming Of Birds & Animals*
- *Minerals And Minerals*
- *Maize Processing(Wet Milling) & Maize Based Projects*
- *Medical Plastics, Disposables Plastic Syringe, Blood Bags*
- *Organic Farming, Neem Products Etc.*

## Sectors We Cover Cont...

- *Paints, Pigments, Varnish & Lacquer*
- *Paper And Paper Board, Paper Recycling Projects*
- *Printing Inks*
- *Packaging Based Projects*
- *Perfumes, Cosmetics And Flavours*
- *Power Generation Based Projects & Renewable Energy Based Projects*
- *Pharmaceuticals And Drugs*
- *Plantations, Farming And Cultivations*
- *Plastic Film, Plastic Waste And Plastic Compounds*
- *Plastic, PVC, PET, HDPE, LDPE Etc.*

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- *Potato And Potato Based Projects*
- *Printing And Packaging*
- *Real Estate, Leisure And Hospitality*
- *Rubber And Rubber Products*
- *Soaps And Detergents*
- *Stationary Products*
- *Spices And Snacks Food*
- *Steel & Steel Products*
- *Textile Auxiliary And Chemicals*

- *Township & Residential Complex*
- *Textiles And Readymade Garments*
- *Waste Management & Recycling*
- *Wood & Wood Products*
- *Water Industry(Packaged Drinking Water & Mineral Water)*
- *Wire & Cable*

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