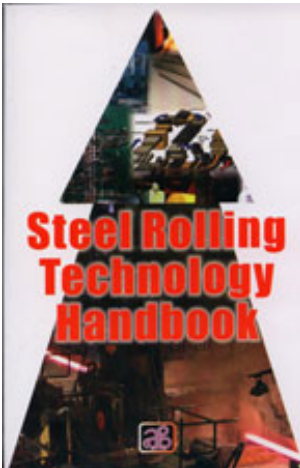


Steel Rolling Technology Handbook



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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. There are three primary steel making processes; open hearth steel making, oxygen steel making and electric furnace steel making. There are two main raw materials used in making of steel; hot metal which is a molten blast furnace iron and scrap which consists of the byproducts of steel fabrication and also of the worn out, broken, or discarded items containing iron or steel. Open hearth process allows high flexibility in regard to a composition of raw material. The most appealing characteristic of the Open hearth furnace is the rapid production of large quantities of basic steel, used for example to construct high rise buildings. Basic oxygen steelmaking also known as the oxygen converter process is a method of primary steelmaking in which carbon rich molten pig iron is made into steel. Hot metal is the principal material used in the BOS (Basic Oxygen Steelmaking) process. Blowing oxygen through molten pig iron lowers the carbon content of the alloy and changes it into low carbon steel. There are three important types of Electric furnace; A.C (alternating current) direct arc electric furnace, D.C. (direct current) direct arc electric furnace and induction electric furnace. The casting process basically involves pouring molten metal into a mold patterned after the part to be manufactured, allowing cooling and removing the metal from the mold. There are various hot mills involved in the production of steel plate mill, hot strip mill, bar and rod mills etc. Techniques of steelmaking have undergone vast changes in scale and new processes have been developed to meet the demands of speed, quantity and quality. The steel industry has had a long history of development, yet, despite all the time that has passed, it still demonstrates all the signs of longevity. Rapid rise in production has resulted in India becoming the 5th largest producer of steel.

Some of the fundamentals of the book are fusion welding processes, arc welding processes: consumable electrode, arc welding processes, width change by rolling and pressing, metallurgical defects in cast slabs and hot rolled products, primary steel making processes, open hearth steel making, oxygen steel making, electric furnace steel making, chemical formulas of steel making, optimization of primary steel making process, secondary steel making processes, methods of continuous casting of thick slabs, optimization and control of width, fundamentals of metal casting, steel making technology, basic principles of width change, types of mills used for the rolling of plates, quality assurance, testing, and inspection etc.

New ideas continue to revolutionize the steel producing process today as much as they did a hundred years ago. The present book covers latest technology of steel rolling, which will give a new path to entrepreneurs

and existing units. It is hoped that this book will be resourceful to researchers, design engineers, technocrats, new entrepreneurs, institutional libraries, training institutes etc.

Contents

CHAPTER 1

FUSION WELDING PROCESSES

Introduction

Oxyfuel Gas Welding

Types of flames

Filler metals

Welding practice and equipment

Process capabilities

Arc-Welding Processes: Consumable Electrode

Shielded metal-arc welding

Process capabilities

Submerged arc welding

Process capabilities

Gas metal-arc welding

Process capabilities

Flux-cored arc welding

Process capabilities

Electrode Gas Welding

Process Capabilities

Electroslag Welding

Process capabilities

Electrodes

Electrode coatings

Arc-Welding Processes

Nonconsumable Electrode

Gas tungsten-arc welding

Process capabilities

Atomic hydrogen welding

Plasma-arc welding

Process capabilities

Thermit Welding

Process capabilities

Electron-Beam Welding

Process capabilities

Laser-Beam Welding

Process capabilities

Cutting

Oxyfuel gas cutting

Process capabilities

Arc cutting

Welding Safety

CHAPTER 2

GRINDING AND ABRASIVE PROCESSES

Grinding and Abrasive

Practices

- Processes
 - Cylindrical Grinder
 - Internal Grinders
 - Surface Grinding
 - Tool and Cutter Grinders
 - Honing
 - Lapping
 - Superfinishing
 - Abrasive-Belt Grinding
 - Mass Media Finishing
 - Abrasive-Media Flow Deburring Machine
 - Miscellaneous Finishing Operations
 - Wire Brushing
 - Polishing
 - Buffing
 - Abrasives, Grinding Wheels, and Stones
- Materials
 - A. Natural
 - B. Manufactured
- Grinding Wheels
- Bonding Processes
 - Vitrified process
 - Silicate process
 - Shellac process
 - Rubber process
 - Bakelite or resinoid process
- Wheel Selection
 - Size and shape of wheel
 - Type of abrasive
 - Grain size of abrasive particles
 - Grade or strength of bond
 - Structure of grain spacing
 - Type of bond material
- Coated Abrasives
- Mass Media Abrasives

CHAPTER 3

WIDTH CHANGE BY ROLLING AND PRESSING

Methods of Width Change by Rolling

Vertical Edgers

Examples of edging practice

Slab Sizing Mills

Effect of Edging Practice on Workpiece End shape

Effect of Edging Practice on Workpiece Metallographic

Properties

Edging in Finishing Mills

Methods of Width Enlargement by Rolling

Width Enlargement with Tapered Rolls

Classification of Sizing Presses

Design of Short-Tool Start-Stop Sizing Presses

Performance of Short-Tool Start-Stop Sizing Presses

Flying Type Sizing Presses

Rocking Type Sizing Presses

Design Optimization of Sizing Presses

CHAPTER 4

METALLURGICAL DEFECTS IN CAST SLABS AND HOT ROLLED PRODUCTS

Classification of Defects in Cast Slabs

Internal Defects in Slabs

Segregation

Non-metallic inclusions

External Cracks in Slabs

Surface Defects in Slabs

Slab Shape Defects

Scaling of Steel During Reheating

Scaling Rate

Effect of the Atmosphere on Scaling

Effect of Residual and Alloying Elements on Scaling

Scaling and Decarburization

Scaling of Steel During Roughing Passes

Scaling of Steel During Finishing Passes

Scaling of Steel During Coiling

Classification of Scale

Primary and Heavy Primary Scales

Furnace Scale

Refractory Scale

Secondary Scale

Red Oxide Scale

Scale Related to Descaling Process

Scale Related to Roll Wear

Contraction Gouges

Scratches and Gouges

Slivers

CHAPTER 5

PRIMARY STEEL-MAKING PROCESSES

Raw Materials

Open-Hearth Steel-making

Oxygen Steel-making

Top-blown (BOP) process

Bottom-blown (Q-BOP) process.

Combination-blown process

Electric-Furnace Steel-making

Chemical Formulas of Steel-making

Chemistry of Refining

Affinity for Oxygen

Basic And Acid Steel-making

Deoxidation of Steel

Optimization of Primary Steel-making Process

Secondary Steel-making Processes

Purpose of Secondary Steel-making

Vacuum Stream Degassing

Recirculation Degassing

Vacuum Ladle Degassing

Argon-Oxygen Decarburization

Non-vacuum Argon Bubbling
Electro-Slag Remelting
Ladle Injection
Vacuum Degassing with Heating
Comparison of Secondary steel-making Processes
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
Defects in Ingots and Slabs
Internal Defects of Ingots and Slabs
External Cracks in Ingots and Slabs
Surface Defects Typical for Ingots
Slab ingot-narrow side
Surface Defects for Concast Slabs
Surface Defects Common for Ingots and Concast Slabs
Slab Shape Defects

CHAPTER 6

OPTIMIZATION AND CONTROL OF WIDTH

CHANGE PROCESS

Methods of Reducing Crop Losses
Pre-forming Slab Ends by Pressing
Methods of Preventing Out-of-Square Slab Cross-Section
Selection of Optimum Width Change Technology
Width Measuring Systems
Camber Measuring Systems
Width Control Actuators
Purpose of Width Control During Edging
Automatic Width Control Systems for Vertical Edgers
Feedforward Control Mode
Combined Feedforward and Feedback Control Mode
Integrated Width Control Systems for Hot Strip Mills
Principle of Plan View Control
MAS Rolling Process
Automatic Plan View Control Systems
Automatic Camber Control Systems

CHAPTER 7

FUNDAMENTALS OF METAL CASTING

Introduction
Solidification of Metals
1 Pure metals
2 Alloys
Structure-property Relationships

Fluid Flow and Heat Transfer
Fluid Flow
Fluidity of molten metal
Heat transfer
Solidification time
Shrinkage
Defects

CHAPTER 8

STEEL MAKING TECHNOLOGY

Principle of Gauge Control
Causes of Gauge Variation
Actuators for Roll Gap Control
Methods of Measurement of Roll Gap
Position Sensors
Closed Loop Control of A Hydraulic Actuator
Dynamic characteristics of Roll Gap Control
Gaugemeter control
Differential Gauge Control
Spacer Gauge Control
Gauge Deviation Control
Strip Tension Control System
Three Stage AGE for Tandem Cold Mill
Feed-forward AGC for Tandem Cold Mill
Flow-Stress Feed-Forward AGC
Non-Interactive AGC
Automatic Tension and Gauge Control System
Interstand Tension Control in Hot Strip Mills
Three-Stage AGC for Tandem Hot Strip Mill
Feed-Forward AGC for the Hot Tandem Mill
Compensation for Imperfection of Mill Equipment
Modeling of Dynamic Characteristics of HAGC
Block Diagram of a Single Stand HAGC
Position Error Amplifier
Lead-Lag Network
Current Controller
Servovalve
Hydraulic Actuator
Mill spring
Mill Stiffness and Mill Structure Weight
Servovalve Droop
Transducers
Actuator Pressure and Force
Mill Stiffness Multiplier
Transfers Functions of Synthesized Blocks
Amplitude Ratios and Phase Shifts of Individual Blocks
Frequency Response Characteristics of Control System
Position Errors and Control Margins
Time Domain Response Characteristics
Compensation of Control System
Compensation for Material Stiffness
Compensation for Oil Height in Actuator

Compensation for Roll Force
Performance of the System Without Strip
Principles of Width and Plan View Control
Lateral Spread
Wusatowski's Formula for Spread
Hill's Formula for Spread
El-Kalay and Sparling's Formula for Spread
Helmi and Alexander's Formula for Spread
Beese's Formula for Spread
Ekelund's Formula for Spread
Principle of Edging
Edging with Flat Cylindrical Rolls
Edging Followed by Reduction in Thickness
Effective Width Reduction
Edging With Grooved Rolls
Fish Tail
Buckling
Width Change and Control in Rolling Mills
Main Objectives and Methods of Width Change
Width Reduction by Rolling
Slab Sizing Mills
Width Reduction by Pressing
Long-tool Sizing Presses
Short-tool Sizing Presses
Start-Stop Type Sizing Press
Flying Type Sizing Press
Improving The Edging Efficiency
Decreasing The Slab Distortion
Methods of Preventing a Fish Tail
Width Enlargement
Automatic Width Control During Edging
Automatic Width Control In Hot Strip Mill
Plan View Control

CHAPTER 9

BASIC PRINCIPLES OF WIDTH CHANGE

Lateral Spread of Initially Flat Workpiece
Main Factors Affecting Lateral Spread
Effect of Slab Initial Thickness on Lateral Spread
Effect of Friction on Lateral Spread
Edging with Flat Rolls
Main Parameters of Dog Bone Shape
Edging Followed by Reduction in Thickness
Effective Width Reduction and Edging Efficiency
Edging with Grooved Rolls
Distortion of Workpiece Plan View
Shape of Workpiece Ends
Buckling
Edge Cross- Sectional Shape

CHAPTER 10

PLATE MILLS

Introduction

Types Of Mills Used for The Rolling of Plates
Plate-Mill Design
The Levelling of Plates
The Cooling, Marking and Cutting of Plates
The Ultrasonic Inspection and Gaging Of Plates
Modern Plate-Mill Installations

CHAPTER 11

HOT STRIP MILLS

Introduction
Steckel Hot Mills
Planetary Mills
Sendzimir Planetary Mills
Single Planetary Mills
The Krupp-Platzer Planetary Mill
Semi-Continuous Hot-Strip Mills
Semi-Continuous "Three-Quarter" Hot-Strip Mills
Continuous Hot-Strip Mills
Roughing Trains
Coilboxes In Hot-Strip Mills
Crop Shear And Descaling Unit
Finishing Trains
Runout Tables and Strip-Cooling Systems
Coilers

CHAPTER 12

QUALITY ASSURANCE, TESTING, AND INSPECTION

Introduction
Product Quality
Quality Assurance
Total Quality Management
Quality engineering as a philosophy
Deming methods
Taguchi methods
Juran methods
The ISO 9000 standard
Statistical Methods of Quality Control
Statistical quality control
Statistical Process Control
Control charts
Process capability
Acceptance Sampling and Control
Reliability
Nondestructive Testing
Liquid penetrants
Magnetic-particle inspection
Ultrasonic inspection
Acoustic methods
Radiography
Eddy-current inspection
Thermal inspection
Holography

Destructive Testing
Automated inspection
Sensors for automated inspection

Chapter 13

BAR AND ROD MILLS

Introduction

The Evolution Of Merchant And Bar Mills

The Development Of Rod Mills

â€œJumpingâ€• Three-High Stands

â€œHousinglessâ€• Stands for Bar And Rod Mills

The Contilooop Arrangement Of Roll Stands

â€œNo-Twistâ€• Mills

The Three-Roll Planetary Mill

Kocksâ€™™ Three-Roll Rod And Bar Mills

Guides

Flying Shears

Cooling Beds

Coiling Facilities

The Stelmor Process

The â€œEasy-Drawâ€• (E.D.) Process

The Design Of Modern Merchant Mills

Modern Rod Mills

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