

Manufacture of Value Added Products from Rice Husk (Hull) and Rice Husk Ash (RHA)



Author: NPCS Board of Consultants & Engineers

Format: Paperback

ISBN: 9789381039809

Code: NI304

Pages: 208

Price: Rs. 1,295.00 **US\$** 125.00

Publisher: NIIR PROJECT CONSULTANCY SERVICES

Usually ships within 5 days

Manufacture of Value Added Products from Rice Husk (Hull) and Rice Husk Ash (RHA)
(Precipitated Silica, Activated Carbon, Cement, Electricity, Ethanol, Hardboard, Oxalic Acid, Paper, Particle Board, Rice Husk Briquettes, Rice Husk Pellet, Silicon, Sodium Silicate Projects)

Rice husk is the outermost layer of protection encasing a rice grain. Rice husk was largely considered a waste product that was often burned or dumped on landfills. Many ways are being thought for disposal of rice husk and only a small quantity of rice husk is used in agricultural field as a fertilizer, or as bedding and for stabilisation of soils. Therefore, the use of rice husk as rice husk ash is one of the most viable solution. The husk can be used for poultry farming, composting or burning. In the case of burning, it has been used as biomass to power reactors to generate thermal or electrical energy. India is a major rice producing country and the husk generated during milling is mostly used as a fuel in the boilers for processing paddy, producing energy through direct combustion and / or by gasification.

The rice husk ash causes more environmental pollution and its disposal becomes a problem, hence requires attention regarding its disposal and its reuse. The ash is mainly composed of carbon and silica due to which it is used to manufacture different value added products. This book provides thorough information to utilize RHA with process pathway for economically valuable products.

This handbook explains manufacturing process with flow diagrams of various value added products from rice husk & rice husk ash, photographs of plant & machinery with supplier's contact details and sample plant layout & process flow sheets. The major contents of the book are rice husk, rice husk ash (RHA), precipitated silica from rice husk ash, activated carbon from rice husk, cement from rice husk ash, electricity from rice husk, ethanol from rice husk, hardboard from rice husk, oxalic acid from rice husk, paper from rice husk, particle board from rice husk, rice husk briquettes, rice husk pellet, silicon from rice husk, sodium silicate from rice husk, packaging.

This book will be a mile stone for the entrepreneurs, existing units, professionals, libraries and others interested in recovery of value added products from rice husk (rice hull) & rice husk ash to explore an

economic way for recycle and reuse of agricultural waste.

Contents

1. Rice Husk (Hull)

Composition of Rice Husk

Properties of Rice Hull

Use & Applications of Rice Husk

(a) As an Industrial Fuel

(b) Preparation of Activated Carbon

(c) Rice Husk as a Fertilizer and Substrate

(d) As Pet Food Fiber

(e) Substrate for Silica and Silicon Compound

(f) Used for Making Bricks

(g) Rice Husk as Fireworks

(h) Used as Pillow Stuffing

(i) Other Uses

Rice Husk as an Adsorbent for Heavy Metals

2. Rice Husk Ash (RHA)

Physical Properties of Rice Husk Ash

Chemical Composition of Rice Husk Ash

Applications

Use of RHA in Several Industrial Applications

1. As a Replacement to Silica Fume

2. As an Admixture in Low Cost Concrete Block Manufacturing

3. As a Tundish Powder in Steel Casting Industries

4. Manufacturing Refractory Bricks

5. Control of Insect Pests in Stored Food Stuffs

6. In the Vulcanizing Rubber

7. In the Water Purification

8. As a Flue Gas Desulphurization Absorbent

3. Precipitated Silica from Rice Husk Ash

Typical Properties

Physico - Chemical Characteristics of Precipitated Silica

1. pH Value

2. Drying Loss

3. Ignition Loss

4. DBP Absorption

5. SiO₂ Content

6. SIEVE Residue

7. Tamped Density

Uses & Applications

Rubber Grade Precipitated Silica

Non Rubber Grade Precipitated Silica

Manufacturing Process

Digestion

Precipitation

Regeneration

Process Flow Diagram

4. Activated Carbon from Rice Husk

Forms of Activated Carbon

Physical Characteristics

Uses and Applications of Activated Carbon

Manufacturing Process

5. Cement from Rice Husk Ash

Varieties of Cement

Uses of Cement

Manufacturing Process

1. Manufacture of Lime

Calcination

Hydration

2. Manufacture of Burnt Rice Husk

3. Mixing & Grinding

4. Packing & Forwarding

6. Electricity from Rice Husk

Procedure of Electricity Generation from Rice Husk

Downdraft Gasification

Purification Unit

Turbine and Generation Unit

7. Ethanol from Rice Husk

Ethanol is Used

Chemical Properties of Ethanol

Grades of Ethanol

Denatured Alcohol

Absolute Alcohol

Rectified Spirits

Manufacturing Process

Cellulosic Ethanol

Purification Distillation

Process Flow Diagram

8. Hardboard from Rice Husk

Properties

Uses of Hardboard

Furniture

Construction

Auto Industry

Packaging and Other

Manufacturing Processes

Blending

Adhesive Preparation

Adhesive Mixing

Mat Formation

Cole Pressing

Hot Pressing

Sanding and Finishing

Process Flow Diagram

9. Oxalic Acid from Rice Husk

Physical and Chemical Properties of Oxalic Acids

Uses of Oxalic Acid

1. Bleaching
2. Removing Stains
3. Removing Rusts
4. Other Uses

Manufacturing Process

Process Flow Sheet

10. Paper from Rice Husk

Uses & Applications

Process of Manufacture for Rice Husk

Raw Material Storage & Preparation

Husk Pulping

Waste Paper Pulping

Screening of the Pulp

Pulp Beating & Refining

Sizing & Loading

Refining

Paper Making and Finishing

11. Particle Board from Rice Husk

Advantages of Particleboard

Uses & Applications

Manufacturing Process of Pre Laminated Board

Flow Sheet for Manufacturing of Pre-Laminated Particle Board

Traditional Approach for Manufacturing Rice Husk Particleboards

Adhesives in Particleboards

1. Synthetic Adhesives

Phenol-formaldehyde (PF)

Urea-formaldehyde (UF)

2. Natural adhesives

Soybean Adhesive

Starch Adhesive

12. Rice Husk Briquettes

Various Types of Briquettes

Biomass Briquettes

Sawdust Briquettes

Agro waste Briquettes

Wood Briquettes

White Coal Briquettes

Uses of Briquettes

Applications of Briquettes in Various Industries

13. Rice Husk Pellet (RHP)

Why Make Rice Husk Pellets?

Property of Rice Husk Pellet

Advantages of Pelletizing Rice Husk into Pellet

a. Good to Environment

b. Convenient

c. High Effectiveness

d. Wide Application

Manufacturing Process

a. Drying

b. Pelletizing

c. Cooling and Packing

Process Flow Diagram

14. Silicon from Rice Husk

Properties

Physical Properties

Chemical Properties

Electrical Properties

Uses

Uses of Silicon Based Products in Different Sectors

Computers and Electronics

Automobiles

Textiles

Household

Personal Care

Healthcare

Paper

Manufacturing

Food and Related Industries

Manufacturing Process

1. Digestion

2. Precipitation

3. Regeneration

Production of Silicon

Process Flow Diagram

15. Sodium Silicate from Rice Husk

Sodium Silicate Physical and Chemical Properties...

Uses of Sodium Silicate

Properties of Sodium Silicate

Manufacturing Process

Safety Procedures in Handling Sodium Silicates

Process Flow Diagram

16. Packaging

Types of Packaging Materials

Plastic

Metal

Brick Carton

Cardboard

Glass

Functions of Packaging

Containment

Protection

Convenience

Communication

Package Environments

1. Physical Environment

2. Ambient Environment

3. Human Environment

Levels of Packaging

Selection of Proper Packaging for Industrial Product

Flexible Industrial Packaging-Paper and Plastic

Rigid Industrial Packaging - Wooden, Metal, Plastic

Labelling

Labels for Chemical Products

17. BIS Specifications

Cement

Activated Carbon

Particle Board

Silicon

Silica

Sodium Silicate

Oxalic Acid

18. Photographs of Plant & Machinery with Supplier's Contact Details

19. Sample Plant Layout & Process Flow Sheets

About NIIR

NIIR PROJECT CONSULTANCY SERVICES (NPCS) is a reliable name in the industrial world for offering integrated technical consultancy services. NPCS is manned by engineers, planners, specialists, financial experts, economic analysts and design specialists with extensive experience in the related industries.

Our various services are: Detailed Project Report, Business Plan for Manufacturing Plant, Start-up Ideas, Business Ideas for Entrepreneurs, Start up Business Opportunities, entrepreneurship projects, Successful Business Plan, Industry Trends, Market Research, Manufacturing Process, Machinery, Raw Materials, project report, Cost and Revenue, Pre-feasibility study for Profitable Manufacturing Business, Project Identification, Project Feasibility and Market Study, Identification of Profitable Industrial Project Opportunities, Business Opportunities, Investment Opportunities for Most Profitable Business in India, Manufacturing Business Ideas, Preparation of Project Profile, Pre-Investment and Pre-Feasibility Study, Market Research Study, Preparation of Techno-Economic Feasibility Report, Identification and Section of Plant, Process, Equipment, General Guidance, Startup Help, Technical and Commercial Counseling for setting up new industrial project and Most Profitable Small Scale Business.

NPCS also publishes various process technology, technical, reference, self employment and startup books, directory, business and industry database, bankable detailed project report, market research report on various industries, small scale industry and profit making business. Besides being used by manufacturers, industrialists and entrepreneurs, our publications are also used by professionals including project engineers, information services bureau, consultants and project consultancy firms as one of the input in their research.

NIIR PROJECT CONSULTANCY SERVICES , 106-E, Kamla Nagar, New Delhi-110007, India. **Email:** npcs.india@gmail.com **Website:** NIIR.org

Sat, 23 Sep 2017 23:50:11 +0530