

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)**

Introduction

Rice hulls (or rice husks) are the hard protecting coverings of grains of rice. In addition to protecting rice during the growing season, rice hulls can be put to use as building material, fertilizer, insulation material, or fuel. Rice hulls are the coatings of seeds, or grains, of rice.



The husk protects the seed during the growing season, since it is formed from hard materials, including opaline silica and lignin. The hull is mostly indigestible to humans.

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. This RHA is a great environment threat causing damage to the land and the surrounding area in which it is dumped. Lots of ways are being thought of for disposing them by making commercial use of this RHA. Rice husk is an agriculture residue abundantly available in rice producing countries.



Global production of rice is approximately 580 million tons a year, and this is rising as the world population and the consumption of rice increases. Rice husk is generally not recommended as cattle feed since its cellulose and other sugar contents are low. Furfural and rice bran oil are extracted from rice husk. Industries use rice husk as fuel in boiler and for power generation. Among the different types of biomass used for power generation, rice husk has a high ash content varying from 18 – 20%, silica is the major constituent of rice husk ash.

Rice husk ash (RHA) is a by-product from the burning of rice husk that can have favorable effects on the soil in terms of acidity correction. The burning of rice husk for power generation in industries has generated a new residue consisting of a mixture of ash, charred hull and fresh rice husk fractions.

Rice husk is a potential material; there are many usage of rice husk either in the raw form or in ash form. Most of the time husk from the mill is either burnt or dumped as waste in open fields and a small amount is used as fuel for boilers, electricity generation, bulking agents for composting of animal manure, etc.

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 stabilization 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.

Use of rice husk ash with cement improves workability and stability of the concrete mixture. It reduces heat generation, thermal cracking, and plastic shrinkage of the material. It also helps in increasing strength, impermeability, and durability of the mixture during the setting period by modifying the pore-structure and blocking the large voids in the hydrated cement paste through pozzolanic reaction. The properties of rice husk ash improves the performance of cement, bricks, and other construction materials.

Increasing demand for rice husk ash in the building & construction application segment is one of the major factors fueling the growth of the overall rice husk ash market.

The global rice husk ash market is projected to reach USD 2.42 Billion by 2020, at a CAGR of 5.15% from 2015 to 2020.

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.

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Niir Project Consultancy Services (NPCS)
can provide Process Technology Book on
Manufacture of Value Added Products from
Rice Husk (Hull) and Rice Husk Ash (RHA)

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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*

We at NPCS want to grow with you by providing solutions scale to suit your new operations and help you reduce risk and give a high return on application investments. We have successfully achieved top-notch quality standards with a high level of customer appreciation resulting in long lasting relation and large amount of referral work through technological breakthrough and innovative concepts. A large number of our Indian, Overseas and NRI Clients have appreciated our expertise for excellence which speaks volumes about our commitment and dedication to every client's success.

We bring deep, functional expertise, but are known for our holistic perspective: we capture value across boundaries and between the silos of any organization. We have proven a multiplier effect from optimizing the sum of the parts, not just the individual pieces. We actively encourage a culture of innovation, which facilitates the development of new technologies and ensures a high quality product.

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*
- *Entrepreneur India (An Industrial Monthly Journal)*

How are we different ?

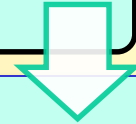
- *We have two decades long experience in project consultancy and market research field*
- *We empower our customers with the prerequisite know-how to take sound business decisions*
- *We help catalyze business growth by providing distinctive and profound market analysis*
- *We serve a wide array of 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*
- *Government Undertakings*
- *Individual Entrepreneurs*
- *NRI's*
- *Foreign Investors*
- *Non-profit Organizations, NBFC's*
- *Educational Institutions*
- *Embassies & Consulates*
- *Consultancies*
- *Industry / trade associations*

Sectors We Cover

- *Ayurvedic And Herbal Medicines, Herbal Cosmetics*
- *Alcoholic And Non Alcoholic Beverages, Drinks*
- *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*

Sectors We Cover *Cont...*

- *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*

Sectors We Cover *Cont...*

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- *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*

Sectors We Cover *Cont...*

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

Sectors We Cover *Cont...*

- *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.*

Sectors We Cover *Cont...*

- *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*

Sectors We Cover *Cont...*

- *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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