

# NAV DURGA METAL INDUSTRIES (Bharat)

The Project has been setup at UPSIDC Site 2, Faizabad (Uttar Pradesh), India with clear vision to develop, produce, expertise in market and provide services with appropriate technologies that are eco-friendly and affordable, likewise provide services to prospective clients that will give them the solutions to their problem & their needs in this context.

A Dedicated Organization with clear vision in providing appropriate technologies in the areas of renewable energy, agricultural Equipments & metal Fabrication in Faizabad, Uttar Pradesh.

Organization was established in 2009 laid by its Five Partners. Commenced its business by "launching Janta Chulha Smokless Stove"for just Rs : 500/- only. Installed approximately 5000 units in rural households of Faizabad, Basti and Sultanpur district. In year 2010 we came out with our new technology for Burning rice husks more clean and efficiently by introducing two new models.

1. Agni Star Gas Stove 2. Agni Sun Gas Stove

Available with DC/AC/SOLAR control panel. Both the stoves are eco-friendly, low cost, easy and convenient to operate, use rice husk as fuel. No smoke during cooking operation No soot on vessels, very low CO/CO2 ratio. Very easily available fuel.Tough Body Made From Stainless Steel

## **Principle & Design of Rice Husk Gasification**

Rice husk gasification is the process of converting rice husks fuel into combustible carbon monoxide by thermo-chemical reaction of the oxygen in the air and the carbon available in this material husk during combustion. In complete combustion of fuel, the process takes place with excess air. In gasification process, on the other hand, it is accomplished with excess carbon. In order to gasify rice husks, about 30 to 40% of the stoichiometric air (4.7kg of air per kg of rice husk) is needed.Gasification of rice husks is accomplished in an air sealed chamber, known as the reactor. Limited amount of air is introduced by a fan into the fuel column to convert rice husks into carbon-rich char so that by thermochemical reaction it would produce carbon monoxide, hydrogen, and methane gases, which are combustible when ignited.

BIOMASS GAS



Basically, the gas produced during gasification is composed of: (a) carbon monoxide, (b) hydrogen, (c) methane, (d) carbon dioxide, and (e) water vapor. The chemistry of gasification and the reactions of gases during the process are illustrated below.

Combustion	C + O2	= CO2	
Water Gas	C + H2O	= CO + H2	
Water Shift Reaction	CO + H2O	= CO2 + H2	
<b>Boudouard Reaction</b>	C + CO2	= 2 CO	
Methane Reaction	C + 2 H 2	= CH4	

Carbon monoxide, hydrogen, and methane are combustible gases while the carbon dioxide and vapor are not.

- 1 Low cooking cost, cheaper fuel.
- 2 Reduced green house gas Emissions.
- 3 Utilizes Agricultural waste "Rice Husk" as fuel for cooking.
- 4 Instant cooking.
- 5 Eliminates Durgery Tasks.
- 6 Increases business opportunities in rural sector.
- 7 Sustainable development.
- 8 Carbon trading benefits(CDM).
- 9 Rice Husk ash can be used for soil conditioning due to high content of silica.

10 Subsidy & Incentives from Govt.

11 Socio-Economic Development.

### Wide range of Domestic & Community cooking Application in Family/schools/Hotels/Dhaba/Bakery.





**U**lin







Agni star is a small gasifire stove which has been approved by **Ministry of New & Renewable Energy, Govt. of India**, Tested & approved as per BIS Standards (Revised Draft 2012) at CRDT, IIT-Delhi, & IMMT Bhubneshwar Orrisa. Now it is widely spread in rural households of northern India. The Basic advantages of AGNI STAR are mentioned below:

- Consumes Less Fuel : only ½ Kgs of Rice Husks provides energy efficient flames for 40 minutes.
- 2. Saves upto 80% of Money invested on Fuel: 1 kg of LPG can be replaced by burning 4 kg of Rice husks.

#### IT DOES NOT REQUIRE FIREWOOD/KEROSENE AT ALL.

3. Protect Health & eliminates the Durgery Tasks: Since it does not require firewood ,Hence no durgery tasks for children & women.

## **SPECIFICATIONS & TECHNICAL DETAILS**

Fuel Required Reactor & Type: Battery Cycle: Fan: Capacity: Effeciency: Operating Time:

Particulate matter: Power Output: CO: ½ Kg of Rice Husk Per Batch Gasifire, Forced Draft
for 10 hrs per full Charge
12V DC Fan
Could take load upto 25 kg.
35% (tested by IIT-Delhi)
40-45 Min. depending
upon operation/Husk type

79.59 mg/MJd 2.16kW 5.23g/MJd





Agni Sun is a Big Size gasifire stove ,Tested at IIT-Delhi as per BIS Standards(Part-1,1991)Now it is widely spread in rural households of northern India.The Basic advantages of AGNI SUN are mentioned below:

- **1. Consumes Less Fuel** : only 1 Kgs of Rice Husks provides energy efficient flames for 70 minutes.
- **2. Saves upto 80% of Money invested on Fuel:** 1 kg of LPG can be replaced by burning 4 kg of Rice husks.

#### IT DOES NOT REQUIRE FIREWOOD/KEROSENE AT ALL.

3. Protect Health & eliminates the Durgery Tasks: Since it does not require firewood ,Hence no durgery tasks for children & women.



## **SPECIFICATIONS & TECHNICAL DETAILS**

Fuel Required Reactor & Type: Battery Cycle: Fan: Capacity: Effeciency: Operating Time:

Particulate matte(TSP): Power Output: CO/Co<sub>2</sub>Ratio: 1Kg of Rice Husk Per Batch Gasifire, Forced Draft for 10 hrs per full Charge 12V DC Fan Could take load upto 25 kg. 30% 60-70 Min. depending upon operation/Husk type

0.7 mg/M<sup>3</sup> 2.16kW 0.03