



**TURNING WASTE INTO WATTS
FROM FIELD TO FUEL.....**



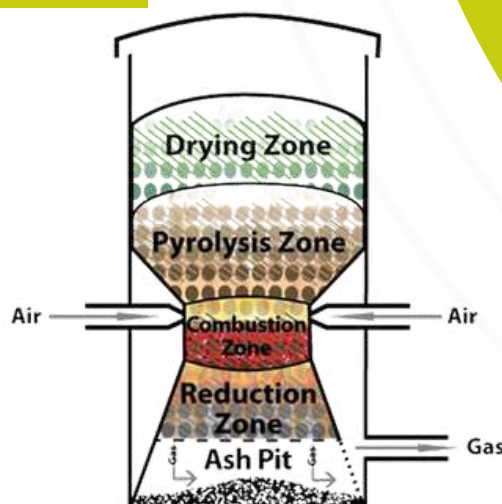
ENERSOL BIOPOWER PVT. LTD.

12KW (15KVA) ESB-R BIOMASS GASIFIER

The ESB-R12 12KW biomass gasifier is ideal for research institutes and catering to small-scale electricity requirements. Featuring patented technology, the ESB-R12 biomass gasifier is designed to be compact, user-friendly, and low maintenance, making it a convenient solution for various applications.

DOWNDRAFT GASIFIER

- Simple design.
- Low tar contents as most of the tar is burnt in combustion zone.
- Best option for usage in gas engines.
- At lower loads, fewer particles in the gas.



KEY FEATURES OF ESB-R12

ESB-R12 12KW biomass gasifier has some unique features which makes it advantageous than other available models in the market. Some of them are listed below:

1

Most suitable for villagers due to the abundance of agro-waste available, which can be utilized to generate their own electricity using this gasifier. As it's a portable unit, villagers can employ it for multiple purposes; for instance, during the day for irrigating farms and at night for electrifying their houses.

2

Smallest, portable, and soundproof gasifier system.

3

Ideal for villagers with ample agro-waste for electricity generation.

4

Maximum atomization with automatic initial firing.

5

Utilizes dry filtration, eliminating the need for water and costly purification plants.

6

Reliable, rugged, and compact design and costly purification plants.

7

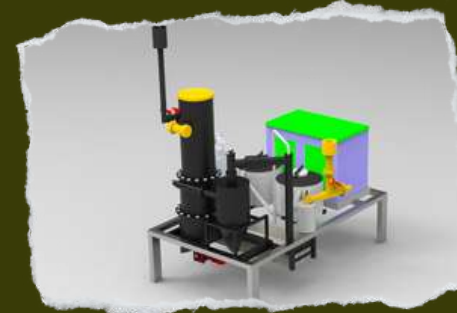
Low maintenance and easy operation.

8

Accessible to both urban and rural communities.



Most
reliable &
rugged
system



Compact
system

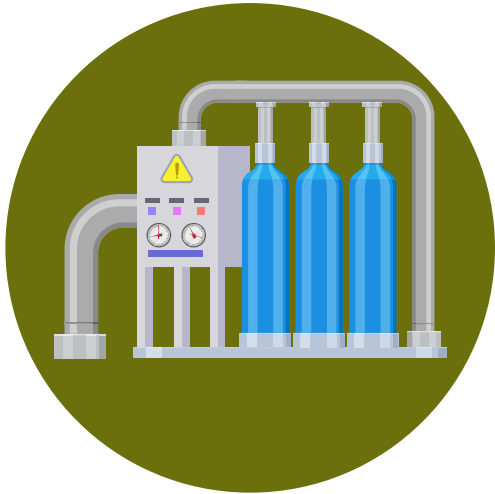
Accepts all
kind of
biomass



PATENTED RS FILTER

**EFFICIENT
TAR
CRACKING**

**SELF-
GENERATED
WATER FOR
CLEANING**



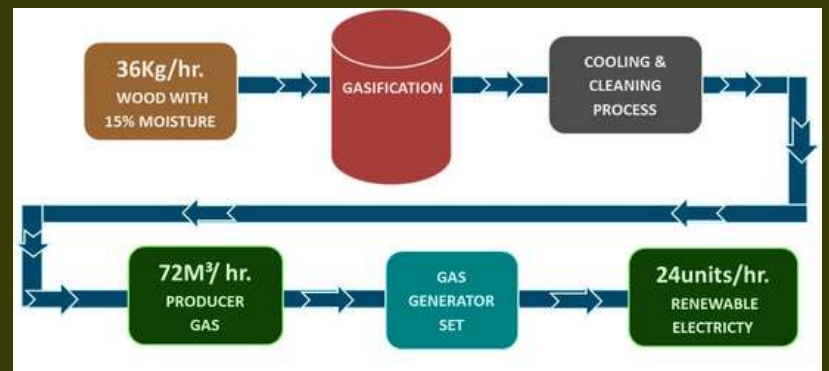
**EXTENDED
FILTER
LIFESPAN**

**CO2
EMISSION
REDUCTION**



WORKING PARAMETERS

- 1 ESB-R Biomass Gasifier can operate at any type of agricultural or forest waste residues with limited moisture in feedstock. To know more about acceptable feedstock, kindly refer the "ESB-R Biomass Gasifier Catalogue" enclosed with this quotation.
- 2 The gasifier works with producer gas which is basically manufactured 'ON-LINE'.
- 3 Clean all the filters and do the required maintenance on time for better performance of gasifier.
- 4 Since Gasifier being a new technology equipment, we advise clients to get properly acquainted with all operational aspects & optional items of Gasifier like biomass characteristic (recommended moisture level, its bulk density, size etc.) as well as suitability of optional items like wood dryer, wood cutter etc. and any other associated accessories.



TECHNICAL SPECIFICATION

Model Name
ESB-R BIO-12

Model No.
ESB-R12

Auxiliary Power
2.5HP

Weight
2 Ton

**Dimension
(Gasifier)**
L10feet
W7feet
H8feet

**Dimension
(Genset)**
L6feet
W3.5feet
H6feet



WORKING PARAMETERS

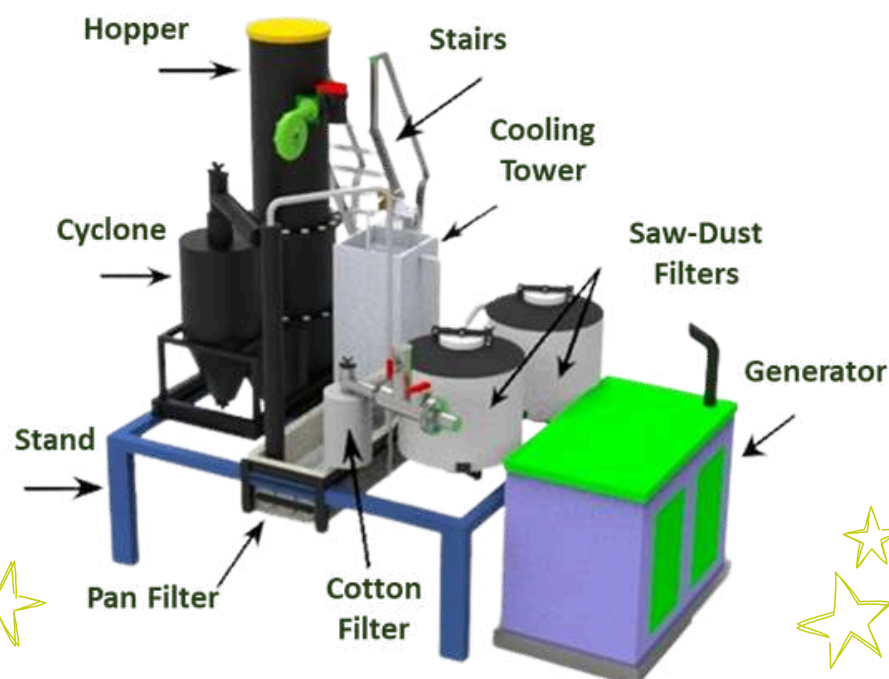
Brand	-	Enersol Biopower®
Type of Gasifier	-	Downdraft
Fuel	-	100% Biomass
Manpower Required	-	1no
Auxiliary Power Details	-	Cooling fan Vibrator motor Water pump Distillation Pump Conveyor motor RS filter pump

Gas in 1 kg wood with 15% moisture	-	up to 2NM³
Wood Calorific Value	-	2100K-2500kcal/kg
Bulk density	-	200kg/m ³
Biomass consumption kg/kw/hr.	-	1.4 ± 0.2 kgs/kw-hr.
Char generation	-	5-25%



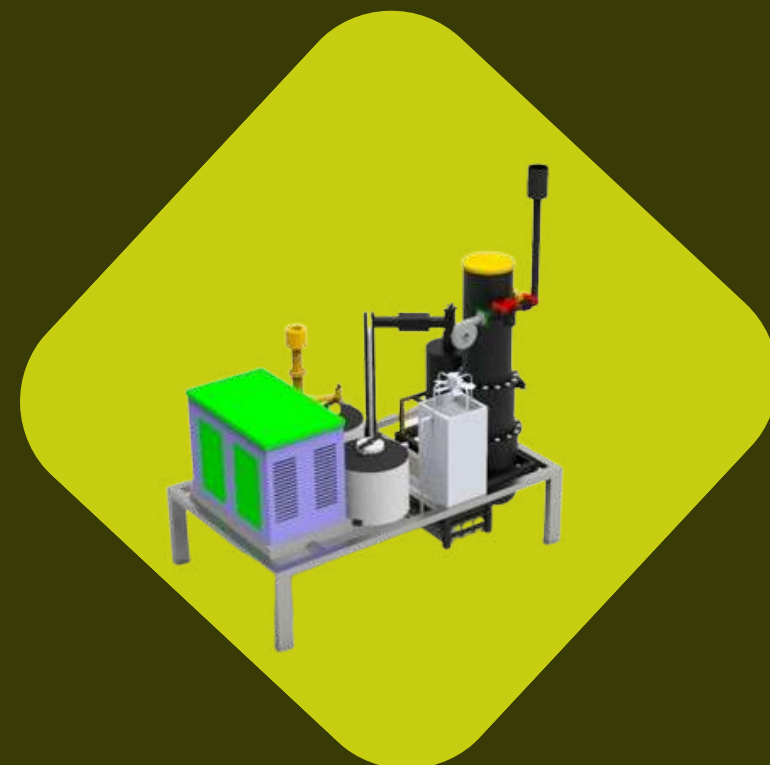
BIOMASS GASIFIER PARTS

PARTS NAME	MADE OF
Hopper	Mild Steel (MS Sheet)
Reduction chamber	Stainless Steel (SS Sheet) & Ceramic bricks
Ash storage tank	Mild Steel (MS Sheet)
Ash removal tank	Mild Steel (MS Sheet)
Cyclone	Mild Steel (MS Sheet)
Scrubber	Stainless Steel (SS Sheet)
RS Filter to remove tar	Mild Steel (MS Sheet) & Stainless Steel (SS Sheet)
Distillation tank	Stainless Steel (SS Sheet)
Saw-dust filter	Stainless Steel (SS Sheet)
Pan filter	Stainless Steel (SS Sheet)
Water tank	Mild Steel (MS Sheet)
Cooling tower	Aluminum sheet with PVC fills
Cotton filter	Stainless Steel (SS Sheet)



BASIC DETAILS

PARTICULAR	DESCRIPTION
Start-up	Automatic ignition
Biomass feeding system	Manual feeding
Feeding Frequency	Every 1.5-2 hrs.
Ash removal system	Semi-automatic
Frequency of removing ash	Every 2-3hrs.
Biomass consumption an hour	up to 18kg/hr.
Acceptable biomass size	2 X 2"
Acceptable moisture content	less than 20%
Ash content	up to 5-10%




BIOMASS GASIFIER OUPUT

Biomass consumption	- up to 18kg/hr.
Gas Flow (NM ³ /hr.)	- 36NM ³
Peak Rated Thermal Output	- 37,800Kcal/hr. to 45,000Kcal/hr.
Continuous Duty Rated Thermal Output (80%)	- 30,240Kcal/hr. to 36,000Kcal/hr.
Average Gas Calorific Value (Kcal/Nm ³)	- ≥1,100
Gasification Temperature	- 1050 – 1100°C
Temperature of Gas at Gasifier Outlet	- 300 to 500°C
Indicative Gasification Efficiency (Hot gas mode)	- >85%
Indicative Gasification Efficiency (Cold gas mode)	- >75%
Turn Down Ratio	- Not less than 50% of rated capacity

FILTER NAME	CLEANING TIME	REMARK
Cyclone	Every 40-50 hrs.	Ash to be removed
Scrubber filter	Every 25-30 hrs.	To be checked
Saw-dust filter	Every 80-100 hrs.	Replace sawdust /coconut husk etc.
Distillation tank	Every 2-3hrs.	Extra water need to be removed
Pan filter	Every 80-100 hrs.	To be cleaned
Cotton filter	Every 80-100 hrs.	Replace cotton fabric
Water tank capacity	250-300ltrs. Approx.	
Water level	Need to maintain minimum 75% water level all the time	


GAS COMPOSITION




Carbon monoxide (CO)
21.4%




Hydrogen (H₂) - 18.9%



Nitrogen (N₂) - 46%



Methane (CH₄) - 3.4%



Carbon dioxide (CO₂) - 10.2%



TECHNICAL DETAILS OF GENSET

PARTICULAR	-	DETAILS
Make	-	Enersol Biopower®
Fuel Mode	-	100% on Producer gas
Capacity	-	12KW / 15KVA
Power factor	-	0.8P.F.
Frequency	-	50Hz
Voltage	-	415V
Phase	-	Three
Rated current (Amps/phase)	-	19Amps/phase
Governor	-	Mechanical / Electronic
Acoustic enclosure (Soundproof canopy)	-	Provided



BASIC DETAILS

Model Name
ESB-R
Bio-Gen15

Model No.
ESB-RBG15

Capacity
15KVA
(12.5KW)

Producer Gas Consumption
15M3/hr.

Ignition
Spark Ignition

Battery
Exide



ENGINE SPECIFICATION

ENGINE SPECIFICATIONS

Bore x Stroke (mm)	-	115 x 115
Stroke	-	Four stroke engine
Rated speed	-	1500RPM
Cooling System	-	Water cooled radiator
No. of cylinder	-	2nos.
Lube oil sump capacity	-	7.2ltrs.
Lube oil change period	-	1st Change: 50-80 hrs 2nd Change: 150-200 hrs Subsequent Changes: Every 250-300 hrs.
Alternator	-	Enersol Biopower



CONTROL PANEL DETAILS

CONTROL PANEL

Oil pressure gauge	-	Yes
Water temperature gauge	-	Yes
Starting switch	-	Yes
Hour meter	-	Yes
Multi meter (Energy, Voltage, Amps, & Frequency indicators)	-	Yes
Phase indicator lamp	-	Yes
Overload relay contractor	-	Yes
Voltage low/high cutoff protection	-	Yes
Frequency low/high cutoff protection	-	Yes
Phase loss protection	-	Yes
Battery charging indicator	-	Yes



FUEL SPECIFICATIONS

Woody biomass such as firewood (branches and twigs), wood chips, bamboo, forestry waste, agricultural waste, crop residues, biomass briquettes, and pellets can be utilized as fuel in ESB-R gasifiers.

The biomass to be used will need to be sized according to our specifications.

To achieve the desired output, the fuel must meet the following standard specifications:

- Net calorific value of not less than 3,600 Kcal/kg.
- Bulk density above 200 kg/m³.
- Ash softening temperature greater than 1,200°C.
- Ash content on a dry basis should be less than 5%.
- Moisture content should be less than 20%.
- Fines below 10 mm should be sieved and removed.
- The feedstock must be free from foreign matter such as dust, dirt, fines, fibers, stones, debris, soil, oil, metal, plastic, glass, etc.



ACCEPTABLE FEEDSTOCK

✓ **Agricultural Wastes**

✓ **Forest Wastes**

✓ **Agro-Industrial Wastes**

✓ **Pellets Briquettes**

✓ **Energy Crops**



ACCEPTABLE FEEDSTOCK



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ACCEPTABLE FEEDSTOCK

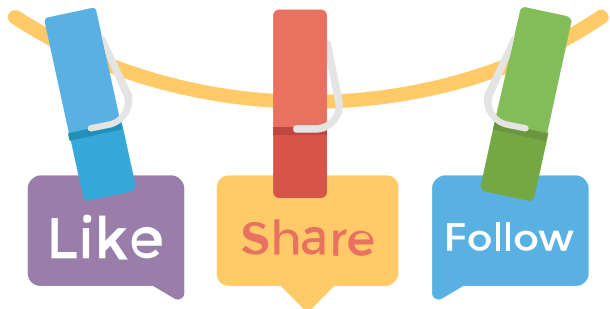


OUR PRESTIGIOUS PARTNERS

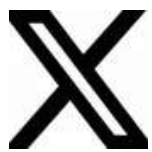


AWARDS & EXHIBITIONS





<https://www.youtube.com/@enersolbiopower-biomassgas3987>



<https://www.indiamart.com/enersol-biopower-jaipur/profile.html>



<https://twitter.com/EnersolBiopower>



<https://www.linkedin.com/company/enersol-biopower-pvt-ltd>



https://www.instagram.com/enersol_biopower/



CONTACT US



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