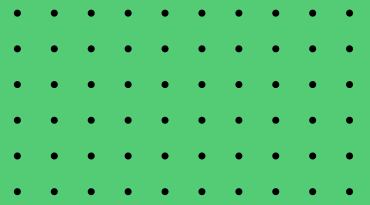




**TURNING WASTE INTO WATTS
FROM FIELD TO FUEL**

ENERSOL BIOPOWER PVT. LTD.

Established in 2013 by Mr. Rai Singh Dahiya, a grassroots innovator in biomass gasifier technology, our company is renowned for its small-size biomass gasifiers, smokeless biomass stoves, and other renewable energy products.



ESB-R10 BIOMASS GASIFIER

**10KW/12.5KVA BIOMASS
GASIFIER**

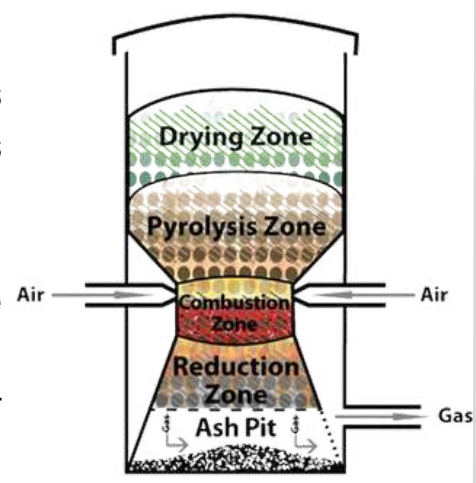


ESB-R10 BIOMASS GASIFIER DESIGN

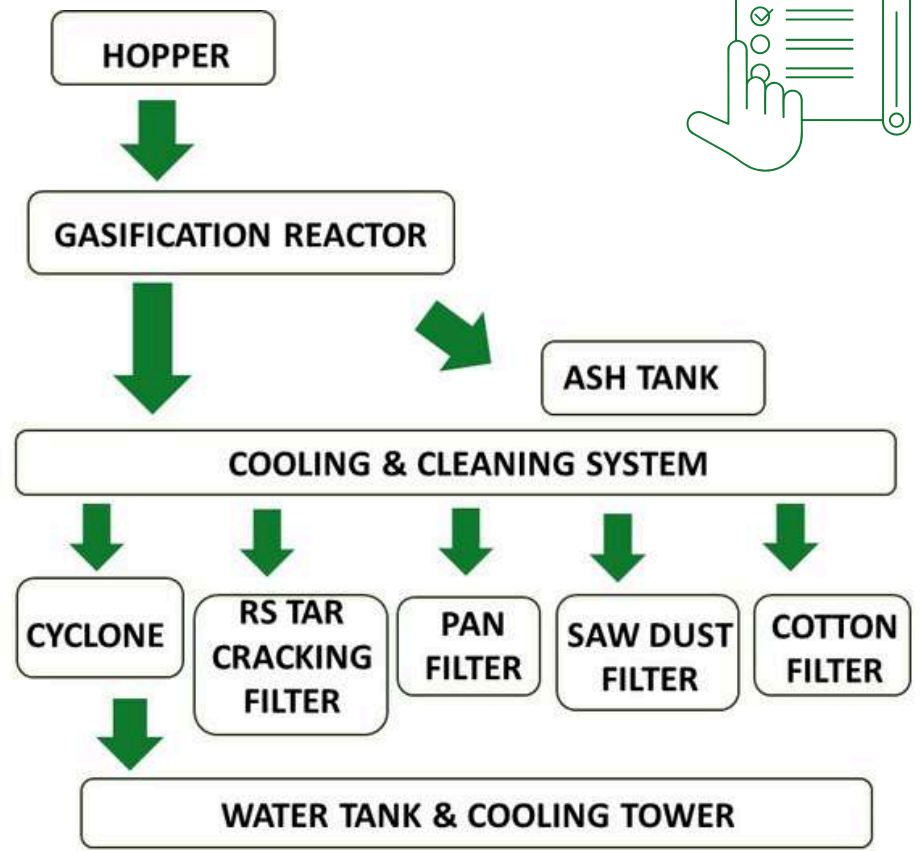
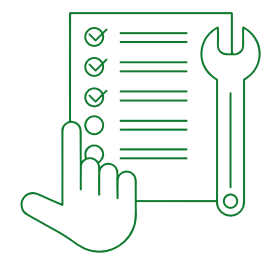
The ESB-R10 10KW biomass gasifier is ideal for research institutes and catering to small-scale electricity requirements. Featuring patented technology, the ESB-R10 biomass gasifier is designed to be compact, user-friendly, and low maintenance, making it a convenient solution for various applications.



- 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.



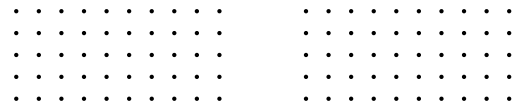
BASIC STEPS INVOLVED



KEY FEATURES OF ESB-R10

ESB-R10 10KW 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



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

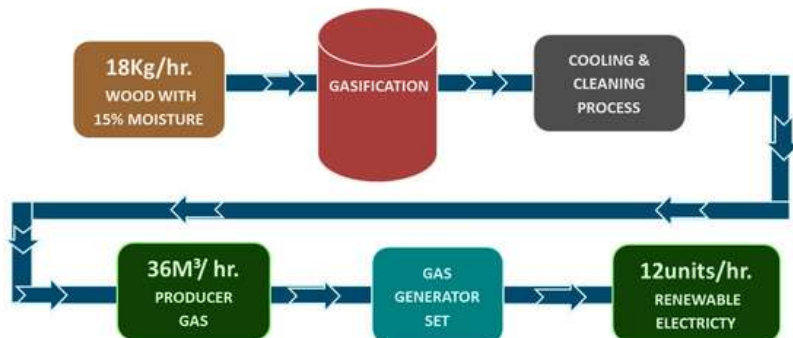
The gasifier works with producer gas which is basically manufactured 'ON-LINE'.

3

Clean all the filters and do the required maintenance on time for better performance of gasifier.

4

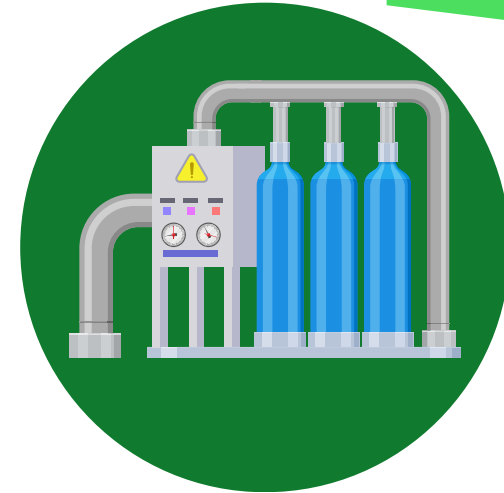
Since Gasifier being a new technology equipment, we advise clients to get properly acquainted with all operational aspects & optional items of Gasifier like biomass characteristic (recommended moisture level, its bulk density, size etc.) as well as suitability of optional items like wood dryer, wood cutter etc. and any other associated accessories.



PATENTED RS FILTER

**EFFICIENT
TAR
CRACKING**

**SELF-
GENERATED
WATER FOR
CLEANING**



**EXTENDED
FILTER
LIFESPAN**

**CO2
EMISSION
REDUCTION**



BASIC PARAMETERS

TECHNICAL SPECIFICATIONS

Model Name
ESB-R BIO-10

Model No.
ESB-R10

Auxiliary Power
2.5HP

Weight
2 Ton

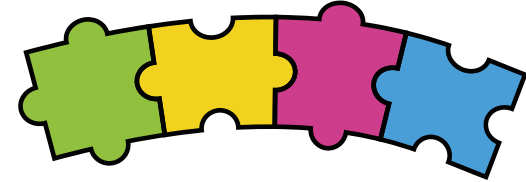
Dimension (Gasifier)
L10feet
W7feet
H7feet

Dimension (Genset)
L6feet
W3.5feet
H6feet

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

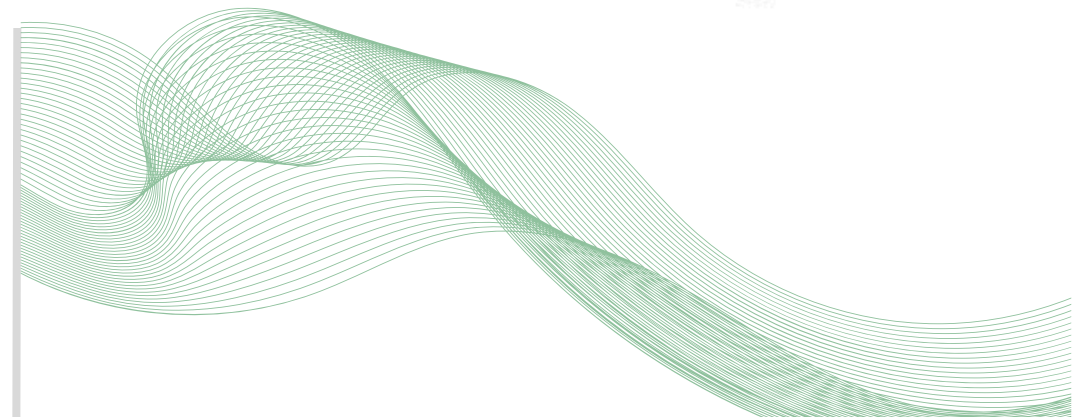
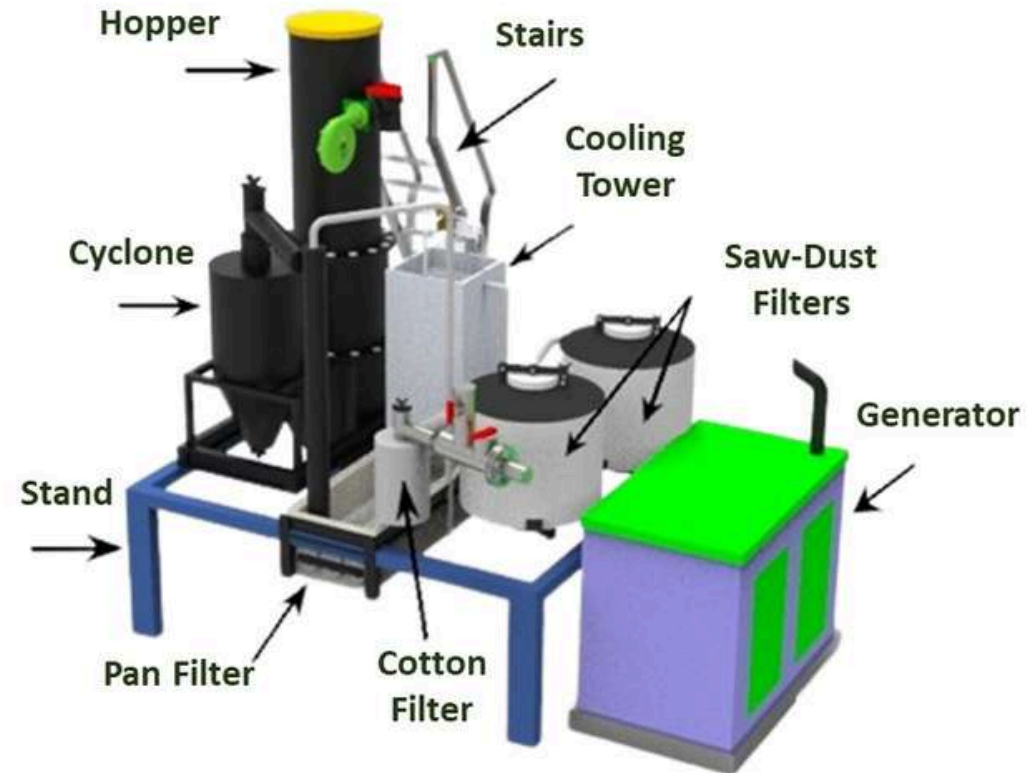
Gas in 1 kg wood with 15% moisture	- up to 2NM ³
Wood Calorific Value	- 2100K-2500kcal/kg
Bulk density	- 200kg/m ³
Biomass consumption kg/kw/hr.	- 1.4 ± 0.2 kgs/kw-hr.
Char generation	- 5-7%





ESB-10 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	- Manual
Frequency of removing ash	- Every 1-2hrs.
Biomass consumption an hour	- up to 15kg/hr.
Acceptable biomass size	- 2 X 2"
Acceptable moisture content	- less than 20%
Ash content	- up to 5-10%



BIOMASS GASIFIER OUTPUT

Biomass consumption	- up to 15kg/hr.
Gas Flow (NM ³ /hr.)	- 30NM ³
Peak Rated Thermal Output	- 31,500Kcal - 37,500Kcal/hr.
Continuous Duty Rated Thermal Output (80%)	- 25,200-30,000Kcal/hr.
Average Gas Calorific Value (Kcal/Nm ³)	- ≥1,100
Gasification Temperature	- 1050 – 1100°C
Temperature of Gas at Gasifier Outlet (°C)	- 300 to 500°C
Indicative Gasification Efficiency (Hot gas mode)	- >85%
Indicative Gasification Efficiency (Cold gas mode)	- >75%



GAS COMPOSITION



Carbon monoxide (CO)
21.4%



Hydrogen (H₂) - 18.9%



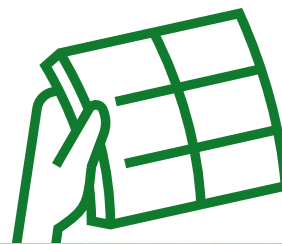
Nitrogen (N₂) - 46%



Methane (CH₄) - 3.4%



Carbon dioxide
(CO₂) - 10.2%



FILTER CLEANING

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 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	
Water Evaporation	10-15 ltr. /hr. approx. (depends on climate of the place)	



TECHNICAL DETAILS- GENSET

PARTICULAR	-	DETAILS
Make	-	Enersol Biopower®
Fuel Mode	-	100% on biogas
Capacity	-	12.5KVA/10KW
Power factor	-	0.8 P.F.
Frequency (Hz)	-	50Hz
Voltage (V)	-	415V
Phase	-	Three phase
Rated Current (Amps/phase)	-	15Amps/phase
Governor	-	Electronic governor
Acoustic enclosure (Canopy)	-	Provided



GENSET BASIC DETAILS

Model Name
ESB-R
Bio-Gen12.5

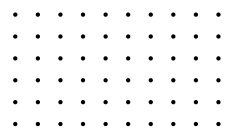
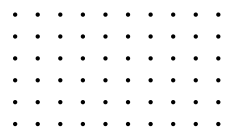
Model No.
ESB-RBG12.5

Capacity
12.5KVA(10KW)

Producer gas Consumption
12.5M3/hr.

Ignition System
Spark Ignition

Battery
Exide



CONTROL PANEL DETAILS

ENGINE SPECIFICATIONS

ENGINE SPECIFICATIONS

Bore x Stroke (mm)	-	102 x 116
Stroke	-	Four stroke engine
Engine power output	-	13HP
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

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**

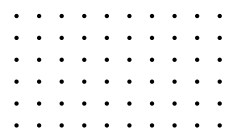
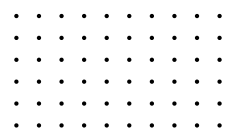
✓ **Pellets & Briquettes**

✓ **Energy Crops**



FUEL - ESB-R BIOMASS GASIFIER





OUR PRESTIGIOUS PARTNERS





AWARDS & EXHIBITIONS





CONTACT US



Enersol Biopower Pvt. Ltd.

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Vishwakarma Industrial Area (VKI),
Road No.-19, Jaipur- 302013 (Rajasthan)



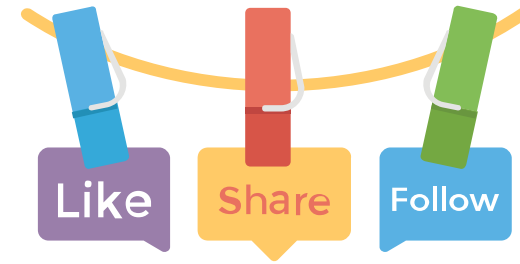
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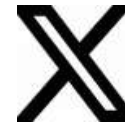
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