

BIOMASS (Non-Woody)

- Herbaceous and fruit biomass -

This leaflet refers to only **herbaceous** biomass as solid biofuel for pellets, briquettes and residues.

Biomass is the third-largest primary energy resource in the world after coal and oil. It provides approximately 14% of the world's energy consumption. Non-woody or herbaceous biomass is a plant-based material from various agricultural wastes that produce heat, steam, and electricity. Hence, it is an alternative to fossil fuels. Various herbaceous biomass materials have different physical and chemical properties that suit each industry. Due to countless agricultural wastes, herbaceous biomass pellets and briquettes are abundantly available.



Burning of straw briquettes

All organic matter contains energy, even food and municipal solid waste (MSW). A lot of agricultural waste is used to make biomass pellets and briquettes.

Forms of processed biomass



Pellets



Briquettes

In recent years, the growing interest in alternative sources of herbaceous biomass increased due to the depletion of wood resources. Many agricultural wastes were trial combustion efficiency with satisfactory results.

Agricultural wastes (residues)⁰



Rice Straw and Stems



Rice Husks (Hulls)



Corncobs



Coconut Husks



Bamboos

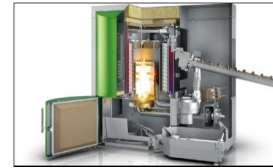
Applications



Residential Heating Stove



Commercial Auto
Cook Biomass Stove



Industrial Boiler



Power Station




Pet Bedding



Animal Feed

Thai standards and classes of non-woody biomass pellets¹		
Properties	Class I	Class II
Bulk density	$\geq 600 \text{ kg/m}^3$	$\geq 600 \text{ kg/m}^3$
Diameter	6 – 25 mm. ± 1 mm.	6 – 25 mm. ± 1 mm.
Durability	$\geq 96.0 \text{ \% w/w}$	$\geq 96.0 \text{ \% w/w}$
Finds	$\leq 3.0 \text{ \% w/w}$	$\leq 6.0 \text{ \% w/w}$
Average length	3.15 – 40 mm. For Ø6 – 10 mm.	3.15 – 40 mm.
	3.15 – 50 mm. For Ø12 – 25 mm.	
Min. length	$\geq 3.15 \text{ mm.}$	$\geq 3.15 \text{ mm.}$
Max. length Ø6 – 10 mm.	$\leq 45.0 \text{ mm.}$	$\leq 45.0 \text{ mm.}$
Length beyond 40 mm.	$\leq 1 \text{ \% w/w}$	$\leq 1 \text{ \% w/w}$
Moisture	$\leq 15 \text{ \% w/w}$	$\leq 15 \text{ \% w/w}$
High heating value	$\geq 14.5 \text{ MJ/kg}$	$\geq 14.5 \text{ MJ/kg}$
Ash	$\leq 10 \text{ \% w/w}$	$\leq 18 \text{ \% w/w}$
Additives	$\leq 5 \text{ \% w/w}$	Unspecified
Chlorine	$\leq 0.30 \text{ \% w/w}$	$\leq 0.30 \text{ \% w/w}$
Sulphur	$\leq 0.30 \text{ \% w/w}$	$\leq 0.30 \text{ \% w/w}$
Nitrogen	$\leq 2.0 \text{ \% w/w}$	$\leq 2.0 \text{ \% w/w}$
Arsenic	$\leq 1 \text{ mg/kg}$	Unspecified
Cadmium	$\leq 0.5 \text{ mg/kg}$	Unspecified
Chromium	$\leq 50 \text{ mg/kg}$	Unspecified
Copper	$\leq 20 \text{ mg/kg}$	Unspecified
Lead	$\leq 10 \text{ mg/kg}$	Unspecified
Mercury	$\leq 0.1 \text{ mg/kg}$	Unspecified
Nickel	$\leq 10 \text{ mg/kg}$	Unspecified
Zinc	$\leq 100 \text{ mg/kg}$	Unspecified

We sell
<ul style="list-style-type: none"> - Herbaceous biomass pellets - Herbaceous biomass briquettes

Packaging (kg.) ²		
Pellets	15 kg.	 <p>Picture shown coconut shells</p>
Briquettes	20 kg.	
Residues	30 kg.	

Transport/Shipment	
Modes of Transport	Containers ³
Ship	40-foot Standard
Railway/Truck ⁴	40-foot Standard

⁰ Residues are available for the domestic market.

¹ Standards and classes differ from international standards of EN, EN-plus, FPI, DIN plus, CANplus, amongst others.
The analysis report shows specific property values for each type of agricultural waste. Contact us for more details.

² Actual packaging may differ slightly due to products from various sources. ‘**yoohong**’ markings and labels are for product traceability.

³ Subject to customs regulations on maximum laden weight/payload.

⁴ An option for customers in Cambodia, China (Yunnan only), Laos, Malaysia Peninsula, Myanmar and Singapore. Subject to service availability.

※ This leaflet may be corrected and updated without prior notice.

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MADE
in
THAILAND