Everything You Always Wanted to Know About Sargassum And Other Stuff (But Were Afraid to Ask!)

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Sargassum FAQs

Q: What about the ash – fly ash and residual ash?

A: This is probably the most asked question… for every application and type of waste material. Two factors are used in our process – 1) We achieve complete and perfect combustion, meaning that we have complete control over the atmosphere inside the unit. With incomplete combustion, such as a conventional incinerator, the waste material sits on a grate, and with a constant fuel source, is allowed to rest and smolder. If you see smoke or smell fumes, it's incomplete. In our technology, the waste material doesn't sit and rest, but burns in full suspension in the vortex. The waste material becomes its own fuel. 2) In addition, the second part of the internal process is similar to a fumes burner, where any combustible material is reintroduced back upstream into the vortex to go back through the process. Based on our patented and exclusive design, the combustible material will repeat that process over and over until it has gone through a complete transformation to a gas.

Q: What happens to all of the heavy metals found in the sargassum?

A: The normal levels of various heavy metals, specifically arsenic and cadmium (but include iron, zinc, copper, lead, and mercury) that have been collected in areas such as Puerto Rico and Quintana Roo in Mexico, show significantly lower levels, and in some cases fall below detectable levels. However, it depends on where and how it's collected. Removing sargassum from the water, shows higher levels of these metals than once it has been beached onshore. For those areas and applications where the sargassum will be taken from the seawater, no pre-treatment is necessary, but we can easily do a post-treatment process (commercially available scrubbers). That will save significant amounts of time and money.

Q: What about salt in the sargassum?

A: Same answer. All of our previous processes for sargassum, only included sargassum that is taken off the beach. If the sargassum is collected in the water, the salt can be taken care of post-treatment.

Q: Do you have to only use one type of waste material in the vortex system?

A: Short answer – no. Again, armed with the knowledge that our patented technology is the only one of its kind in the world (for now), our system offers an extreme level of efficiency. If we weren't doing waste-to-energy (WtE), then we could always push the capacity to the highest level without compromising the process or efficiency. However, when we are in a WtE process, the only thing we need to ensure is that we are getting 32,000,000 BTUs being processed. We have a thermal efficiency of 98%, meaning we only have a 2% heat loss. When the system has 2,000ºF temperature inside, due to the level of refractory brick, the outer steel shell will be whatever the ambient temperature. So, if you mix and match the waste materials, you only need to add up the various volumes so that the inherent BTU value of the various materials adds up to 32 million BTUs. This is an important feature, since sargassum has a season that runs from March to October. When energy recovery is occurring, there will need to be a sufficient volume of other waste materials to augment the volume of the sargassum available.

Q: Where does the ash go?

A: (One of our favorite questions!) The technical'ish answer is that because of our patented process, no ash material is allowed to exit through the exhaust, because of being reintroduced into the vortex in a controlled manner, so that any remaining combustible material after it goes through the immediate destruction/transformation phase repeats that process until it's totally gone. Imagine tossing something into a fire, and instead of leaving behind ashes, the fire keeps pulling them back in and burning them down until there's nothing left. The 90 mph vortex (tornado) and 2,000ºF heat keep reusing the ash until it's completely gone – like a self-cleaning fire that leaves no mess behind.

Q: How exactly does that work, to be able to calculate the 32 million BTUs?

A: It's actually quite simple. All materials have an inherent BTU value. Obviously materials like tires or plastics have the highest, due to their composition, including hydrocarbons and rubber. For example:

RECIPE 1: Balanced Waste Stream Blend

Goal: Utilize a mix of common waste types (MSW, biomass, plastics, sargassum)

Waste Type	BTU/lb	Quantity (lbs)	BTU Contribution
MSW	4,000	2,500	10,000,000
Woody Biomass	8,000	1,000	8,000,000
Plastics	17,000	800	13,600,000
Water-Collected Sargassum	3,000	133	400,000
TOTAL		**4,433 lbs**	**32,000,000**

Please see this and other "recipes" in our publication:

Recipes To Use In A Thermal Vortex Process

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Here are four "recipes" (fuel blends) designed to reach a total 32 million BTUs for a Thermal Vortex Combustion process, using combinations of the materials and their BTU values you provided:

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TOTAL		**4,433 lbs**	**32,000,000**

🔥 RECIPE 2: Landfill + Tires + Red Bags

Goal: Focus on landfill material, with high-energy tires and medical waste for energy boost

Waste Type	BTU/lb	Quantity (lbs)	BTU Contribution
Combustible Landfill	3,500	4,000	14,000,000
Shredded Tires	16,000	1,000	16,000,000
Medical Waste – Red Bags	7,000	286	2,000,000
TOTAL		**5,286 lbs**	**32,000,000**

🔥 RECIPE 3: High-BTU Dominant

Goal: Minimize feedstock volume using mostly high-BTU waste (plastics + tires)

Waste Type	BTU/lb	Quantity (lbs)	BTU Contribution
Plastics	17,000	1,200	20,400,000
Shredded Tires	16,000	600	9,600,000
MSW	4,000	500	2,000,000
TOTAL		**2,300 lbs**	**32,000,000**

🔥 RECIPE 4: Coastal Waste + Combustible Landfill

Goal: Highlight use of sargassum and landfill to hit target

Waste Type	BTU/lb	Quantity (lbs)	BTU Contribution
Beach-Collected Sargassum	4,000	2,750	11,000,000
Combustible Landfill	3,500	6,000	21,000,000
TOTAL		**8,750 lbs**	**32,000,000**

Thermal BTU Values of Various Waste Materials

The following table provides estimated thermal energy values (in BTU per pound) for various waste materials. These values are useful in evaluating the energy recovery potential of different waste streams using thermal vortex combustion or similar waste-to-energy technologies.

Material	Estimated BTU/lb	Notes
Municipal Solid Waste (MSW)	4,000	Mixed waste including paper, plastics, food, etc.
Woody Biomass	8,000	Dry wood waste, sawdust, branches.
Plastics (mixed)	17,000	High energy content due to hydrocarbons.
Tires (shredded)	16,000	Rubber and carbon black.
Combustible Landfill Material (aged)	3,500	Low moisture solids remaining from buried waste.
Medical Waste (red bag)	7,000	Pathological and plastic-heavy materials.
Sargassum (water-collected)	3,000	High moisture content, partially decomposed.
Sargassum (beach-collected)	4,000	Lower moisture, sand contamination may affect value.
Waste Coal (Coal Fines)	8,000	Low-grade coal with fine particles.
Wind Turbine Blades	6,000	Composite fiberglass and resin; combustion varies.
Great Pacific Garbage Patch Material	12,000	Mostly floating plastics, ropes, fishing gear.