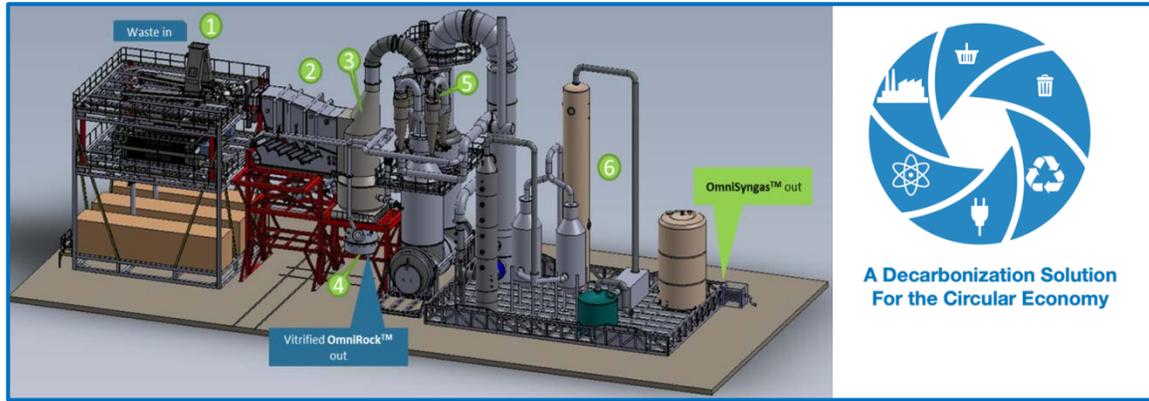


Omni200™ Gasification & Plasma Refining System (GPRS™)

Process Description



1. Proprietary feeder air lock

Feed preparation is minimal for a wide variety of waste: only shredding to 10cms (4") required. The OMNI200™ GPRS™ feeder air lock consists of two horizontal positive displacement piston pumps, each capable of delivering the full rated throughput. This provides a plug of compressed feedstock that permits feedstock to enter the converter without air entering the system.

2. Horizontal moving grate gasifier

The converter consists of a vessel with a series of horizontal moving grates. The grate sections provide forward movement and agitation of the feedstock. Oxygen and steam heated by recovered heat from the refining process are introduced in measured amounts at each grate rising through pile, to cause efficient drying and pyrolysis.

3. Vertical Fixed Bed Updraft Gasifier

Char enters from the converter at the top together with particulate recovered from the gas cleaning system. Oxygen-rich moist heated gas coming from the lower section gasifies the fixed carbon and heavy metals. Gas rich in CO, H₂ and some CH₄ rises from the gasifier, leaving behind the inorganic portion. This fraction is heated by the reaction to the melting point and drips through a water cooled grate into the Solids Residue Melter below.

4. Solids Material Recovery Vessel (SRM)

The SRM is maintained at a temperature sufficient to superheat the molten solids with burners fueled by OmniSyngas™. Additional oxygen and steam are introduced using injection nozzles above the superheated melt. The oxygen-rich atmosphere in the SRM ensures decarbonization of the melt. The melt is tapped continuously and quenched with water to make a nonleachable slag product which has a number of beneficial uses.

5. Syngas Plasma Refining Chamber

All gasification in the OMNI CT process takes place without plasma. Plasma is only used for refining. In the refining chamber, a small amount of oxygen is mixed with the syngas to raise its temperature, while it is simultaneously subjected to the plumes of (2) plasma torches ensuring plasma catalysis. Plasma catalysis is extremely efficient at breaking down tars and hazardous compounds, removing 99.95% of tars at 300°C-400°C less than would be required without the plasma.

6. Gas Cooling and Conditioning to end use

The syngas is cooled and moisture is removed through a proprietary integrated process. Particulate, HCL, sulfur and heavy metals including mercury, are removed. The end output is a consistent energy rich, tar free OmniSyngas™. All particulate is recycled back into the process, for 100% diversion from landfill into either useful syngas or nonleachable aggregate.

Converting wastes to valuable OmniSyngas™ for production of: Hydrogen, Aviation fuel, Bio-gasoline.

Unique Features of OMNI200™

The OMNI200™ GPRS™ unit is proven at industrial scale. It is a complete integrated system, delivered to site in large modules, rather than stick-built. It receives and converts at a rate of 200 tonnes per day (67,000 tonnes per year) a wide variety and mix of energetic wastes into a clean consistent syngas with a predictable heating value and composition. The H₂/CO ratio can be tailored to the final application. Multiple units can be readily combined for larger plants.

 <ul style="list-style-type: none"> ❖ No emissions to atmosphere ❖ Negative carbon intensity ❖ Omniverous feedstocks 	 <ul style="list-style-type: none"> ❖ Minimal feestock preparation ❖ 100% diversion from landfill 	 <p>Each unit 50m x 16m</p> <ul style="list-style-type: none"> ❖ Small Footprint ❖ Modular & pre-built ❖ 200 tonnes per day
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Three Outputs from OMNI200™ GPRS™

 <ul style="list-style-type: none"> ❖ OmniSyngas™ • Clean • Tar Free • Conditioned for end-use 	 <ul style="list-style-type: none"> ❖ OmniRock™ • Non leachable • Commercial value 	 <ul style="list-style-type: none"> ❖ Water
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OmniSyngas™ is a refined gas tailored to a wide range of applications

OmniSyngas™ is a precursor to the production of hydrogen and bio-fuels. Municipal solid waste has more than 50% biogenic content. This will produce green fuels and avoid methane from sending waste to landfills. Since methane has 25x the GHG effect of CO₂, these fuels can be produced with a **negative carbon footprint**. Further reduction is possible by separating the CO₂ in the syngas.

 <ul style="list-style-type: none"> ❖ Hydrogen 	 <ul style="list-style-type: none"> ❖ Bio-gasoline 	 <ul style="list-style-type: none"> ❖ Sustainable Aviation Fuel 	 <ul style="list-style-type: none"> ❖ Electricity
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OMNI CT is an integral part of the circular economy, converting waste streams to valuable fuel in a more efficient and flexible process than current technologies today. OMNI CT's robust efficient GPRS™ is providing a unique solution to achieving decarbonization targets.



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