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**TIRE
PYROLYSIS SYSTEM
PROPOSAL**

**Pure Form
Carbon LLP**



About Pure Form Carbon

P. F. C diligently engaged in research and development within renewable fuels. With over two decades of experience, we have established a solid track record in pyrolysis and the renewable fuels sectors.

Our expertise extends to the dynamic fields of renewable and sustainable fuels.

We offer consultancy services to diverse industries in India and abroad. Our innovative approach drives efficient environmentally friendly operations for pyrolysis plants, gasifiers, pellet dryers, distillation, green hydrogen production, ash removal technology, recovered carbon black system, and more.

We design, develop, and manufacture cutting-edge plants from concept to reality.

Our unwavering commitment is to meet and exceed customer requirements while promoting growth within a defined timeframe through cost-effective solutions.

Tire Pyrolysis (TP) System


*Turning Waste into Sustainability:
Fueling the Future with Used Tires*

- In the coming years, waste tire to oil could be a game-changer as a sustainable business model. Stricter environmental rules are reshaping industries. The world is moving toward a circular economy. Tire waste is a growing concern. Pyrolysis provides an
- efficient solution. It breaks down old tires into valuable fuel. This process reduces pollution and promotes sustainability. It also creates economic and employment opportunities. Cleaner energy and less waste mean a better future for all. We are your trusted ally for tire pyrolysis system and expert guide as turnkey solution
- provider. The push for alternative energy, tighter waste regulations, and growing interest in sustainable solutions create a
- strong investment opportunity.





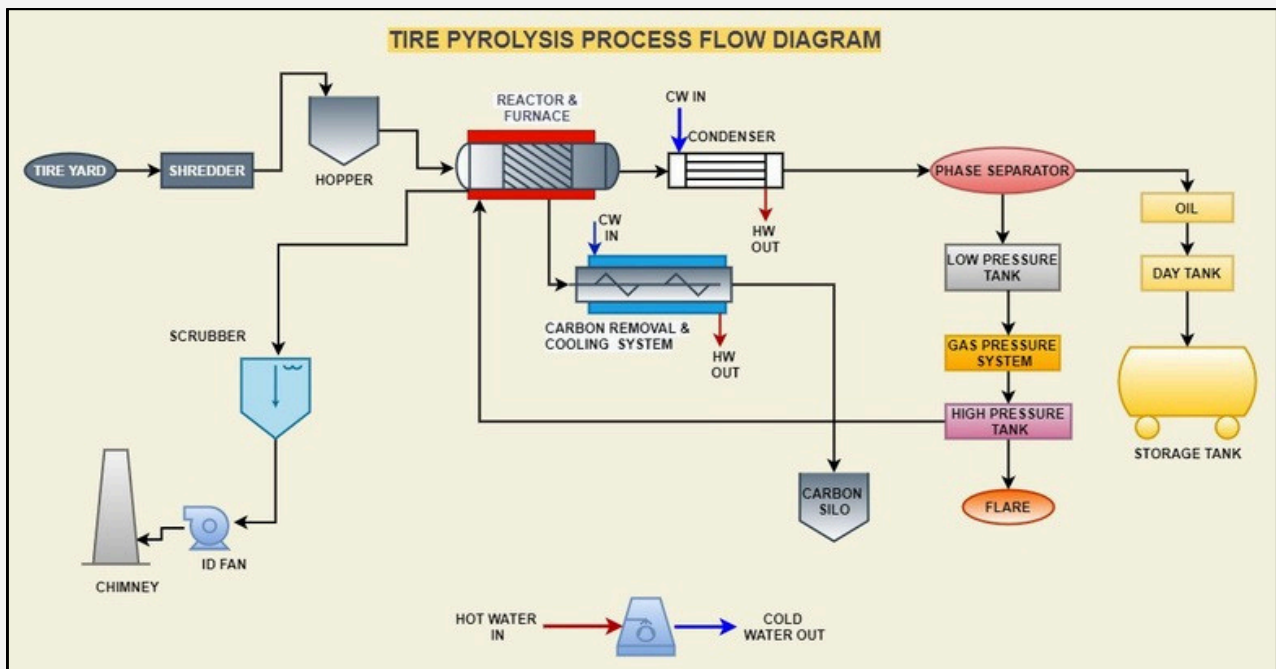
Tire Pyrolysis Plant Comprises



- Feeding System
- Pyrolysis Reactor
- Furnace
- Carbon Removal System
- Condenser & Phase Separator
- Gas Pressure Handling System
- Oil Collection
- N2 Purging
- CO2 Flushing System
- Exhaust Gas Treatment Line
- Flare



Process Flow Diagram





Feeding System

- The feeding or raw material charging in any continuous plant is very crucial. A higher quantity can absorb heat and cool the reactor, while smaller quantities can cause an increase in reactor temperature. Optimum charging controls the temperature effectively. The dosing must be automated and 'Fool-Proof' to ensure smooth operations.

Pyrolysis Reactor

- We recommend 516/70 Gr. As MOC for the reactor. The reactor's job is to transfer the heat. The outer surface of the reactor absorbs the heat and transfers to the raw material. We need to take a consideration of the Heat
- transfer coefficient. BQ material has higher heat transfer than any stainless steel. Sufficient surface area for the heat transfer is the crux of the matter. The placement of the reactor, carbon discharge port and the drying zone
- temperature with the generated hot gas draft ensures the low VM in Tire Pyro-Char. Pure Form Carbon technocrats have mastered these tactics.

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Furnace

- Furnace design is itself a job of an expert. That defines the efficiency and the heat transfer as well. The Gap between the furnace wall insulation and the reactor surface is the key to efficient heat transfer by radiation. The Pure Form team has designed the furnace considering many other hidden aspects of thermodynamics.

Carbon Removal System

- Carbon Removal System: This system ensures the safe discharge of generated tire Pyro-Char by cooling it while transfer. The design can tolerate the wires up to 3 %.
- The heavy duty motors, gearboxes are selectively placed in order to avoid the jamming which is a common problem in tire pyrolysis plants.



Condenser & Phase Separator System

- The condenser or Heat exchangers are the vitals of the Tire Pyrolysis Plant. The heat load calculation is the fundamental basis for deciding the heat transfer area of the Tube Shell type of condensers. Pure Form's Chemical engineers are thermodynamic experts.

Gas Pressure Handling System

- Automated pressure-regulating system with robust and standby blowers to drive the generated gases and ensure the system pressure at desired levels. It keeps the system
- safe from the pressure and so the probable leakages while the system is in operation. That gives a fair chance to the
- plant operator to take proper action. This system is also supported by a UPS. This is a vital defence system in
- continuous-type of plants.



Oil Collection

- The heat exchanger/s or Condenser/s condense the condensable vapours, mostly condensable oil vapours and the rest of gas is non-condensable is allowed to enter into phase separator. This phase separator has a bottom discharge and a gas vent. The bottom discharge is for oil, equipped with the 'U' seal. The oil is collected in a day oil tank to transfer to storage.

N2 Purging

- N2 purging helps to restrict the entry of the atmospheric air in reactor and thus in system. While charging of the raw material, there is always a chance for air to enter in the system. That results in more water generation and the fire hazards as well.



CO2 Flushing System

- The system can be flushed with CO2 at any point in time and control the damages, in case of an emergency. This is a specially designed system as a last line of defence.
- It is absolutely manual and the operator can make a decision to initiate the CO2 flooding. Due to CO2
- expansion, the system temperature drops instantaneously and the system is saved from the thermal or fire damages.



Exhaust Gas Treatment Line

- The generated gas is used as a fuel for the pyrolysis system. This gas is supplied to the burners and it is burn in the furnace. The exhaust of the furnace is transferred to
- Wet scrubber through an insulated duct. Well and efficient wet scrubber cleans the exhaust gas with water mist. The particulate matter and unburnt hydrocarbons are taken
- away in the scrubber with many passes of water mist. A few chemicals can be also used in order to clean the exhaust gas abiding the environmental regulations. At the
- same time, the gas temperature is also controlled before allowing it to pass in atmosphere. The clean gas is blown into chimney by an appropriate capacity fan.

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Flare

Most of the time, the gas generated is more than its use. The automated flare is provided to safely burn this excess gas at a prescribed height.



Footprints

		POWER - KW			LAND SQ. MTR		
SR. NO.	PLANT CAPACITY	CONNECT ED	CONSUM PTION	WATER/D	OPEN	COVERED	MAN POWER/D
1	12 MTPD	90	72	6 KL	4000	1000	12
2	24 MTPD	120	96	12 KL	6000	1500	12
3	30 MTPD	150	120	15 KL	8000	2000	12
4	36 MTPD	180	144	18 KL	10000	2500	15
5	48 MTPD	210	168	24 KL	12000	3000	18
6	96 MTPD	240	192	48 KL	14000	3500	18



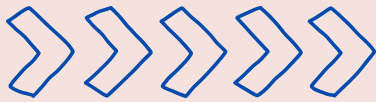
TP Plant Problem

High VM in the Char –

- High VM Char is difficult to mill. The VM in other words, the oil is not that you want in your Tire Char. That makes milling difficult. If your char has some Iron particles with
- high VM, there is a fair chance of char catching fire. When it comes to pelleting high VM char after milling, it
- requires higher volumes of water. That results in the high- water content in the pellets and thus, the fuel required for drying is more. The process cost is directly proportional to VM in the Tire Pyrochar.

Pure Form Carbon Technology is the solution:

Our Pyrolysis system design ensures the low VM (Less than 5%) in the residual Tire Pyrochar.



Solution

- **HOW?**

Design & MOC of the reactor:

- **High Heat Transfer** through the reactor surface area.
- **Sufficient Surface area** for the Pyrolysis Reaction and drying of char. Well calculated and effective Vapor Draft
- **to ensure taking vapors to the condensation as soon as the vapors are generated.** Reflux & weeping is restricted with scientific designing. Not only the design & MOC but
- **also reactor placement.**
-

THE CUMULATIVE RESULT OF PROPER DESIGN:

- **Safety.** – UPS supported Gas Pressure Handling System
- **Dry Tire PyroChar** - Placement of rightly designed reactor.
- **Low Heat loss** - By Efficient Furnace design, selection of Insulating material.
- **Higher Oil Generation** – Complete Pyrolysis & Lower oil content escaping in the Tire Pyrochar.



Pure Form Carbon's Unique Selling Points

At Pure Form, we are committed to advancing innovation in the renewable sector through dedicated research and development. With an in-house R&D department and laboratory, we conduct all research within our own facility, ensuring complete control over the development process.

- **Design:** Our plant's design, crafted over 10+ years by a multidisciplinary team, emphasizes safety and precision. Components are designed with fundamental thermodynamics and material balances, ensuring a customized solution for clients. **Material of Construction:** We select the material of construction very scientifically. The selection depends on the application, the parameters, requirements of heat transfer, chemical compatibility etc. **Workmanship:** We follow international guidelines for fabricating equipment, using specialized welding methods like TIG and MIG for exceptional durability, reliability, and safety. **Sealing:** Selection of sealing material is an expert's job. Temperature, reaction, pressure, chemical compatibility etc. **Insulation:** We provide high-quality Cera-wool insulation to minimize heat loss and maximize efficiency. **Automation:** The plant comes with advanced automation software, IoT, and HMI capabilities, allowing remote monitoring and eliminating human error. **Laboratory Backup:** Our lab analyses raw materials and product quality, helping optimize operations. We guide your staff to ensure efficiency and profitability.
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We are very concerned about safety of our client. We never compromise on the quality.



Key Attributes That Set Our Technology Apart

- **Custom Design:** Tailored solutions to meet specific operational needs.
- **Zero Liquid Discharge:** Eco-friendly processes with no harmful emissions.
- **Compact:** Space-efficient design as per the client's land layout without compromising performance.
- **User-Friendly Operation:** Intuitive systems ensure ease of use.
- **Full Automation:** Integrated with advanced HMI, IoT, and MQTT technologies.
- Our system design is efficient, reliable, and safe.

Projects And Collaborations

- Successfully installed and commissioned various plants in India and abroad.
- Continuously upgrading technology in collaboration with clients.
- Executing complete turnkey projects, including drawing, design, and development.
- Assisting clients with plant procedure optimization and product development.



Facility And Infrastructure

- **Land Area:** Factory spans 6914 Sq. Mtr (1.71 acres) with a covered area of 2835.88 Sq. Mtrs. **Workshops:** Separate industrial sheds for heavy fabrication and machine shops. **Workforce:** Highly skilled staff ensuring quality and productivity. **Infrastructure:** Equipped with modern machinery and advanced technology. Our facility is outfitted with a comprehensive range of fabrication machinery to support diverse manufacturing processes.
- **Engineering:** Dedicated department for drawing, development, supervision, and inspections.

Equipment

- **Fabrication Machinery:** Equipped with TIG and MIG welding machines, plasma cutters, lathe machines, rolling machines, and drilling machines for precision and versatility. **Heavy Lifting Equipment:** Forklift and overhead traveling (OT) crane for safe handling of heavy reactors. **Outsourced Services:** Laser cutting and CNC bending are handled by a reliable associate. Local service providers support milling, grinding, and fine machining. **Efficiency Enhancement:** Acquired a CNG goods carrier to reduce dependency on external logistics, saving time and meeting deadlines. **Design and Technology:** Utilizes AutoCAD software with a team equipped with high-performance desktops and laptops. UPS power backup ensures uninterrupted operations during outages.



Facility And Infrastructure

- **Testing Capabilities:** Comprehensive hydro testing ensures product integrity and performance under high-pressure conditions. Advanced radiography detects internal flaws for reliable and durable components. **Calibration and Training:**
- Regular calibration of testing tools and scheduled training programs maintain precision in practices. **Fabrication**
- (NDT), **Testing:** Non-destructive testing including ultrasonic and dye penetrant methods, inspects welds and materials for surface and internal defects without damage.
- **Quality Assurance:** Rigorous testing processes ensure high-quality, reliable, and high-performance fabricated products.
- **Outsourced Services:** Reliable laser cutting and CNC bending services, alongside local providers for milling, grinding, and fine machining.
- **Efficiency Enhancement:** CNG goods carrier reduces dependency on external logistics and ensures timely operations.
- **Design Software:** AutoCAD utilized on well-maintained desktops and laptops, supported by UPS power backup for uninterrupted functionality.

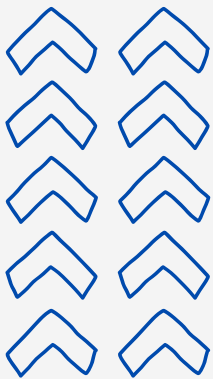
Conclusion & Call to Action




This proposal offers a compelling opportunity to establish a waste tire pyrolysis plant, contributing to sustainable waste management while generating substantial revenue. With your support, we can efficiently bring this innovative solution to market, promoting environmental benefits and economic growth. We eagerly anticipate your feedback and approval to proceed with this transformative venture!



Let's schedule a follow-up meeting to discuss implementation details.



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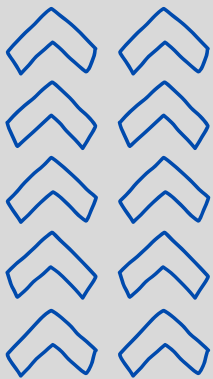
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