Geodyn™ Solution Geodyn reactor Line Model

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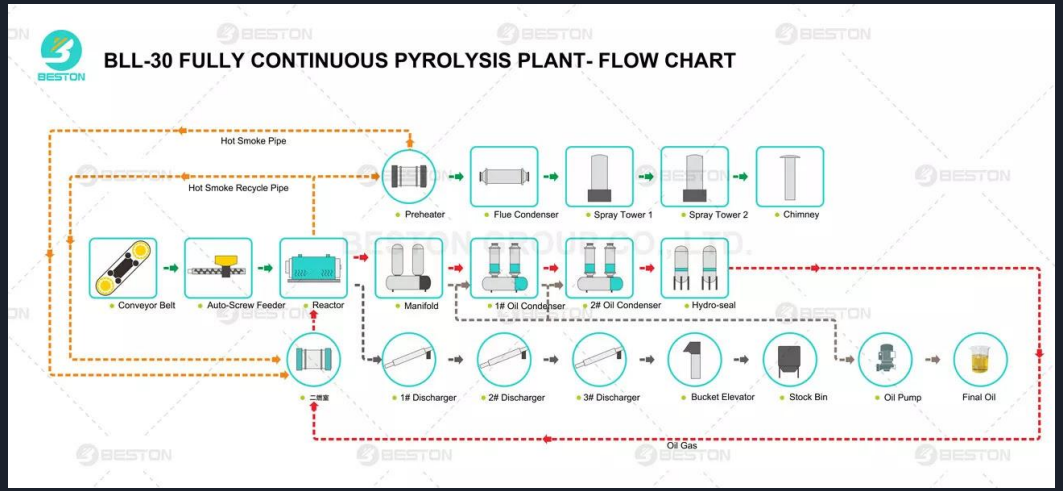
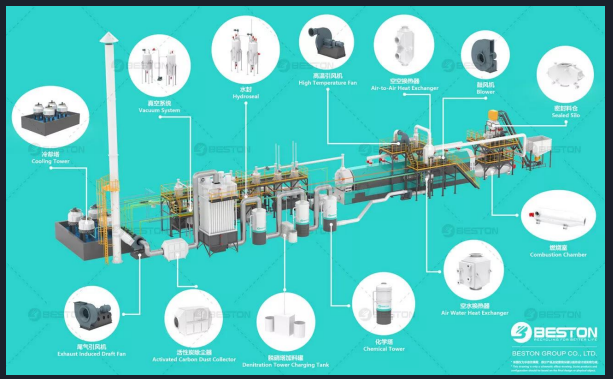
Industrial Continuous Scrap Tire/ Waste Plastic Geodyn reactor Production Line





Commercial
Company Overview

GeoDyn™ is committed to promoting sustainability by transforming discarded and unusable materials into a new, environmentally friendly product that enhances the overall quality of life. As a global leader in innovation, efficiency, and recycling, GeoDyn™ Technologies develops technological solutions that align with the 'GeoDyn™ philosophy' to improve our world and the lives of its inhabitants. Our goal is to introduce these innovations to the global market, driving positive change towards a sustainable future.

Technical-advantages

- Our expertise lies in the research and development of technology, as well as the manufacturing of equipment that is specifically designed to convert scrap tires and waste plastic into usable oil.
- Our team of professionals specializes in research and development, bringing a wealth of knowledge and expertise to the table.
- We employ cutting-edge technology in Geodyn reactorfield, enabling us to maintain our position as a leader in the industry.

Non-cooking heat distribution	• Industrial continuous operation with large capacity
Hot air tight	• Safe operation
Gas purification & Heat recovery	• Environment-friendly and low consumption
Smart control	• Few labors and clean production
Low-temp catalytic Geodyn reactor	• Better product quality and higer efficiency

Technical Process flow

Technical Process flow

- Geodyn reactor process involves continuously feeding shredded tire chips into a hot, airtight environment along with a low-temperature sulfur transfer catalyst to initiate the reaction.
- Following the low-temperature Geodyn reactor cracking reaction under atmospheric conditions, the resulting pyro oil gas is distilled and cooled to produce liquid fuel oil and a small quantity of combustible gas.
- Once scrubbed, the combustible gas is utilized in the heat supply system, which incorporates a heat recovery process to significantly reduce energy consumption and production costs.
- The exhaust gas produced by the production line is released following a purification process.
- Through magnetic separation, the solid byproducts - crude carbon black and steel - are separated. The crude carbon black is then transferred to the carbon black processing area, while the steel wire is recovered as waste steel

Technical Subsystems

1. Tire Shredding System (Optional)
   - The process involves shredding used tires into rubber chips and using magnetic separators to remove most of the steel.
2. Feeding System
   - Geodyn reactor system is fed with shredded tire chips through automatic conveyors and a belt scale.
3. Geodyn reactor System
   - Under atmospheric and catalytic conditions, the tire chips undergo a complete Geodyn reactor.
   - Geodyn reactor system comprises reactors, heat supply equipment, and flue gas recycling equipment. The heat supply equipment primarily utilizes the incondensable combustible gas obtained from tire Geodyn reactor as fuel. The high-temperature flue gas produced from burning the fuel is combined with recycled flue gas to provide heat for Geodyn reactor, thereby minimizing energy consumption and exhaust gas discharge.

Technical Subsystems

4. Oil Gas Cooling System
    - After being induced from the reactor, the oil gas is cooled and separated. The liquid oil is directed to the oil gathering tank and pumped to the oil tank farm, while the incondensable combustible gas is passed through a scrubbing system for purification.
5. Incondensable Combustible Gas Scrubbing System
    - The incondensable combustible gas produced during Geodyn reactor is combined and reacts with an alkali solution in a spray filler tower, where harmful components like hydrogen sulfide and mercaptan are eliminated. The purified combustible gas is then transported to a pressure maintaining tank and utilized as fuel in a burner.
6. Discharging System
    - After Geodyn reactor, the solid outputs are cooled using a water cooling discharger and a water cooling elevator. The magnetic separator is used to separate steel from carbon black, with the former being directed to a receiving hopper and the latter delivered to a buffer silo.

Technical Subsystems

7. Gas Purification System

   - Once cooled, the gas from the recycling device will be channeled into an alkali absorption tower and purification tower for purification. This process effectively eliminates sulfur dioxide, particulate matter, and other pollutants in the flue gas, ensuring the gas is discharged in accordance with regulations.

8. Control System

   - The production line employs a PLC (Programmable Logic Controller) for automatic control of control points. This enables functions such as data collection, calculation, record keeping, report printing, and safety precautions to ensure the safe, stable, and continuous operation of the production line.

Technical Outputs

The process achieves a 100% recovery rate from scrap tires and waste plastic, resulting in high-value marketable products.

Scrap Tire Geodyn reactor Process

45%-50%
Fuel Oil

32%-36%
Carbon Black

10%-15%
Steel

Waste Plastic Geodyn reactor Process

Fuel Oil

Solid Fuel

Asphalt

Product Applications: Oil

The fuel oil produced without any treatment closely resembles GB#4 light fuel oil and has a stable price, making it suitable for a wide range of applications.

Some typical applications of the untreated fuel oil include:

- Large, low-speed diesel engines
- Industrial furnaces
- High-power HFO generators

Some typical applications of oil after it undergoes distillation and purification include:

- Bunker fuel
- Blending agent for trucks and other heavy equipment
- Gasoline and diesel fuel fractions

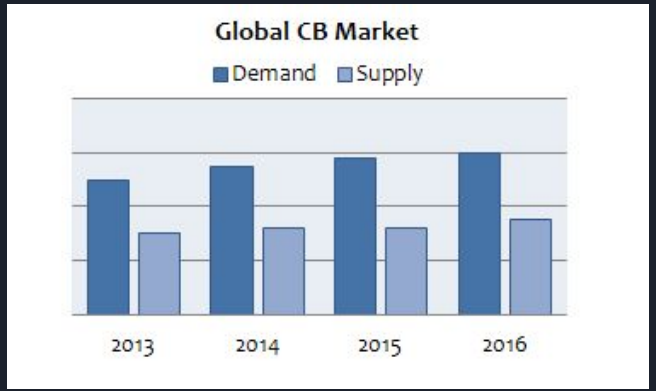
Product Applications: Carbon Black

Geodyn™ Solutions' carbon black is a highly profitable product that can be sold as an end product or further processed for added value.

Some typical applications of carbon black after milling include:

- General rubber and plastic products
- Bicycle tires
- Plastic masterbatch

The global carbon black market has experienced a shortage over the past few years, leading to a demand for cost-effective substitutes.

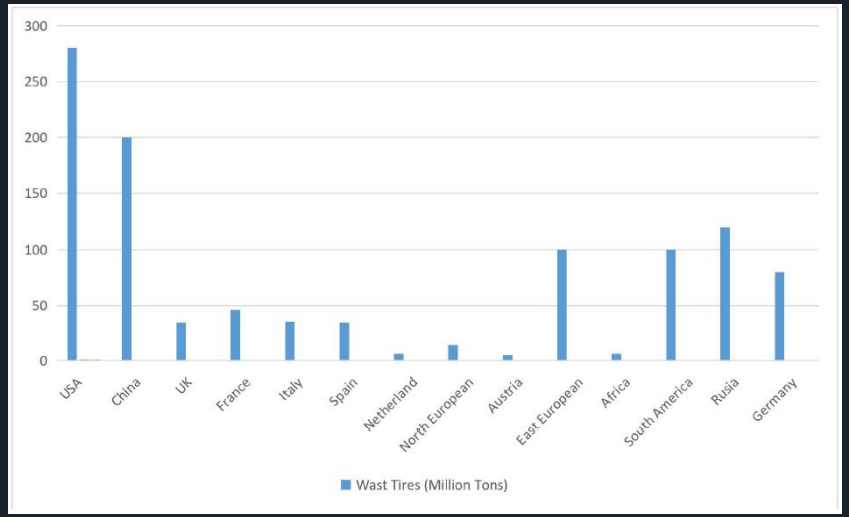


PROPOSAL FOR 5 T/H FULLY CONTINUOUS WASTE TIRES GEODYN SOLUTION 3*MLL-30T

BACKGROUND OF SETTING GEODYN PLANT

Rubber industry has been in an extremely important position in the national economy, especially with the rapid development of the automobile industry, the number of tires increased year by year. However, rubber products will eventually lose their function and become scrap resources, especially the tire scrap speed is faster, the service life of a tire is only half a year to about 1 year. Billions of tires are consumed around the world every year

The number of waste tyres produced worldwide each year



A new problem in front of us, that is to waste tire management and treatment. Waste tires have strong heat resistance, mechanical resistance and degradation resistance, and will not be naturally digested for decades. If discarded in the natural environment, it will not only occupy land and waste resources, but also form a new "black pollution". If it is buried and incinerated as solid waste, it will seriously pollute the environment. Simple refurbishment processing and then loading on the road, there are safety risks; Reclaimed rubber produced by original processing has both pollution and low utilization rate.

A "one-size-fits-all" solution is to crack waste tires, which can be completely converted from a solid state to a liquid state and burned as fuel oil, thereby truly eliminating pollution from waste tires. Therefore, cracking the tire is the best choice to completely solve the pollution of waste tires. It not only produces fuel oil, but also recycles industrial black carbon and steel wire. Practice has proved that the heat of every kilogram of waste tire is about 40MJ/KG (basically similar to diesel) calculation, if not fully utilized, the world is equal to wasted 20 million tons of crude oil. At present, waste tire regeneration, refurbishment less than 20%; But more than 80% are not recycled as raw materials. If it is used for oil refining, it will increase in value greatly.

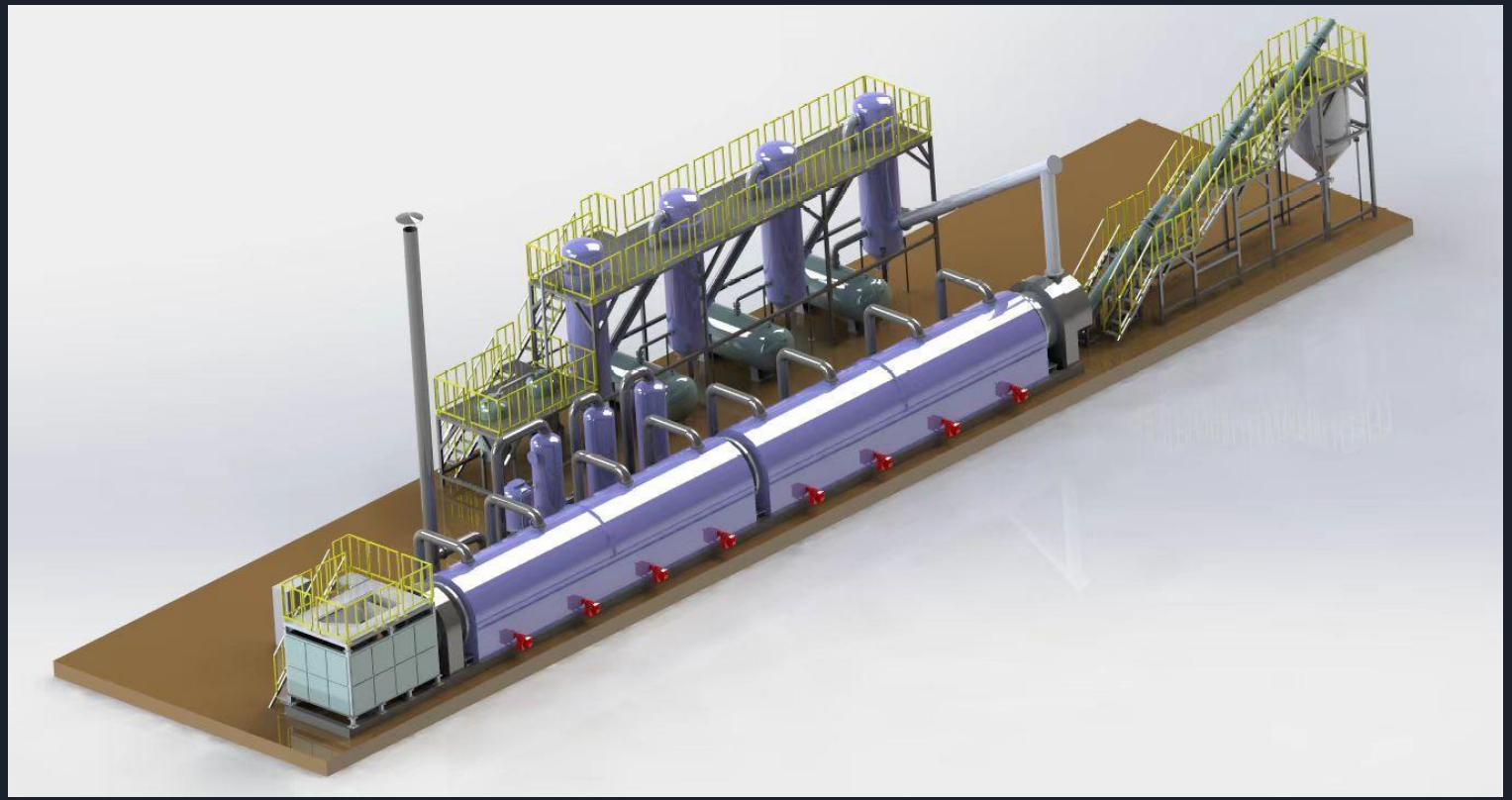
It has become an indisputable reality to realize circular economy and sustainable development in waste tire disposal industry. In the face of the problems of high consumption, high pollution and resource and environmental constraints that always go hand in hand with economic development, the world has begun to seek a comprehensive transformation of the economic growth model and take the path of economic development.

Waste tire pyrolysis, is the embodiment of social progress, is the inevitable trend of the development of environmental protection; Waste tire Geodyn all use, turn harm into profit, benefit mankind, the prospect is very broad.

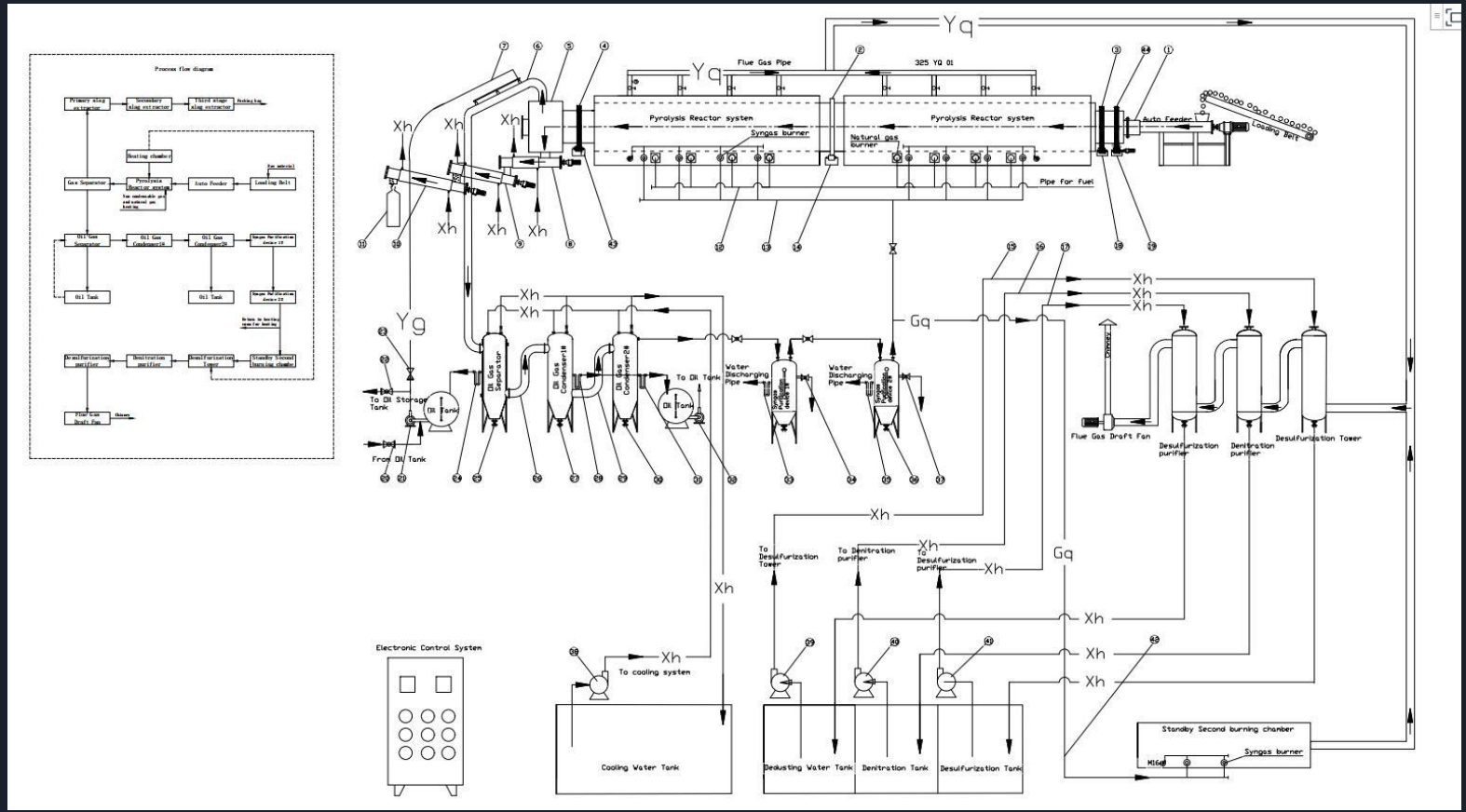
I. WASTE TYRE GEODYN PLANT BASIC PARAMETERS

Model	MLL-30T
Working Method	Fully Continuous
Capacity	40T/D for rubber granules, 45T/D for whole tires
Reactor Structure	Horizontal, Rotary
Reactor size	Φ1600mm*L26000mm
Reactor material	Q345R
Power	82KW
Heating Fuel	Diesel/Pyrolysis oil/Natural Gas/LPG + Syngas
Fuel consumption	800kg diesel for initial heating
Labors	4-5 staffs per shift (including tire shredding system)

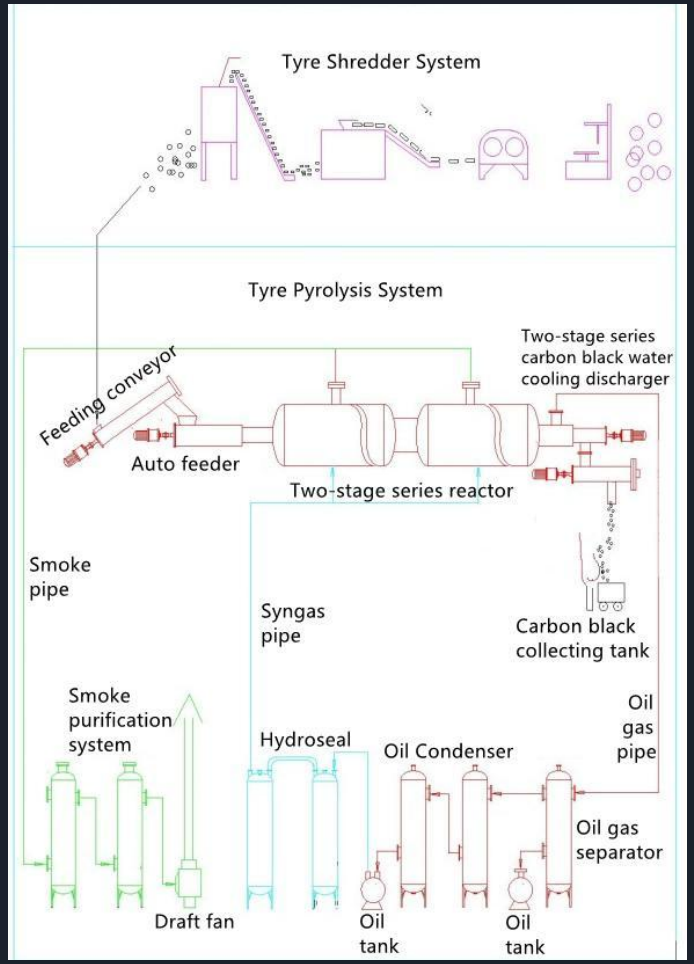
II. 3D PHOTO FOR REFERENCE



III. WORKING FLOW CHART



IV. COMPLETE SOLUTION FLOWING CHART



V. DESCRIPTION

1. The rubber granules, should be loaded into the reactor by auto screw feeder,

2. Continuous Pyrolysis, generally constant heating the raw materials through one or more combinations of tandem reactors (the number is determined according to the size), continuous operation, the pyrolysis process can be completed.

3. Continuous fractionation, heat exchange and cooling of oil liquid to recover syngas. This is a fully automated process. After high temperature pyrolysis of the material, the material basically become oil and gas evaporation, entering the catalytic tower for cracking, and separation of each component; The condensers converts oil and gas into oil and non-condensable gas. Recycling syngas as its own fuel.

4. The whole process of continuous automatic and uninterrupted carbon black discharge. Oil sludge after pyrolysis remains is only slag, which is discharged through the water cooling automatic slag discharger system, into the collection tank.

5. To purify the flue gas. The flue gas of heating combustion is treated comprehensively by the flue gas purification system and then discharged in to the atmosphere.

VI. ADVANTAGES OF THE CONTINUOUS PYROLYSIS PLANT

Innovative continuous technology, high production efficiency, in line with the industrial policy. Continuous and automatic production is beneficial to improve production efficiency; It's conducive to reducing energy consumption; beneficial to reduce labor intensity; Conducive to project approval and good for environmental protection.

Innovative rotary reactor "modular" series combination technology, flexible adjustment of production scale. The basic characteristics of this technology are: the main pyrolysis equipment adopts "modular" series structure, according to the production needs, can be combined to meet the size of the production scale of multiple pyrolysis reactor. A production line can achieve the scale of 20 tons to 100 tons; Even if the scale of 100 tons also as long as a feeder, a slag, a set of cooler, and can greatly save the use of area, save investment, reduce the operation link, save manpower. Thoroughly solve the problem that the production scale of more than 10 tons will use more production lines in the past. At the same time, as a single reactor size is small, easy to container packing transportation, easy to field combination.

Innovate a number of protection measures for equipment operation, safer equipment operation

1. supporting the innovation of "flexible seal leakage prevention technology", the key of this technology is the invention of "flexible" sealing method and structure. In the past, the sealed rigid mechanical seal, or the packing seal, will appear cracks in the different movement of the equipment and lead to air leakage, so that accidents frequently occur. The flexible seal is on the contrary, it depends on the moving soft material always keep with the transmission automatic closure, foolproof to prevent the leakage of oil and gas.

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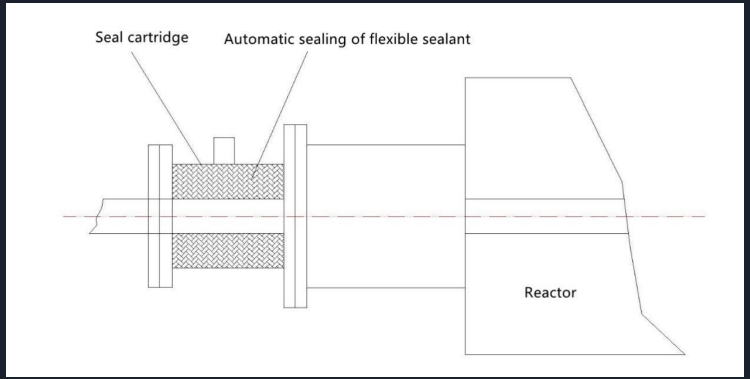
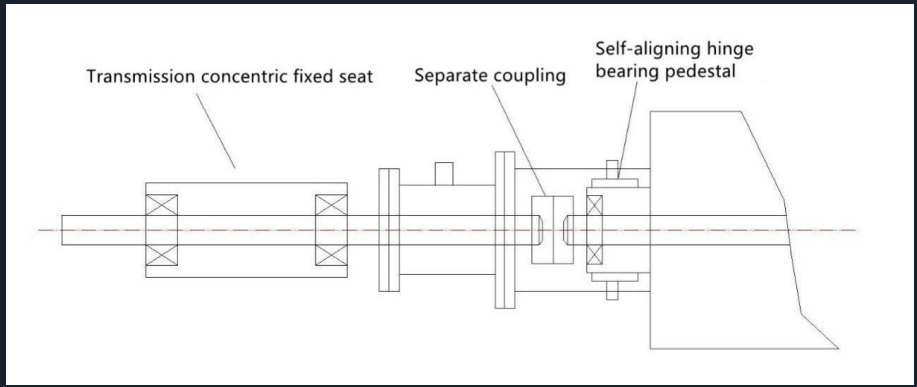
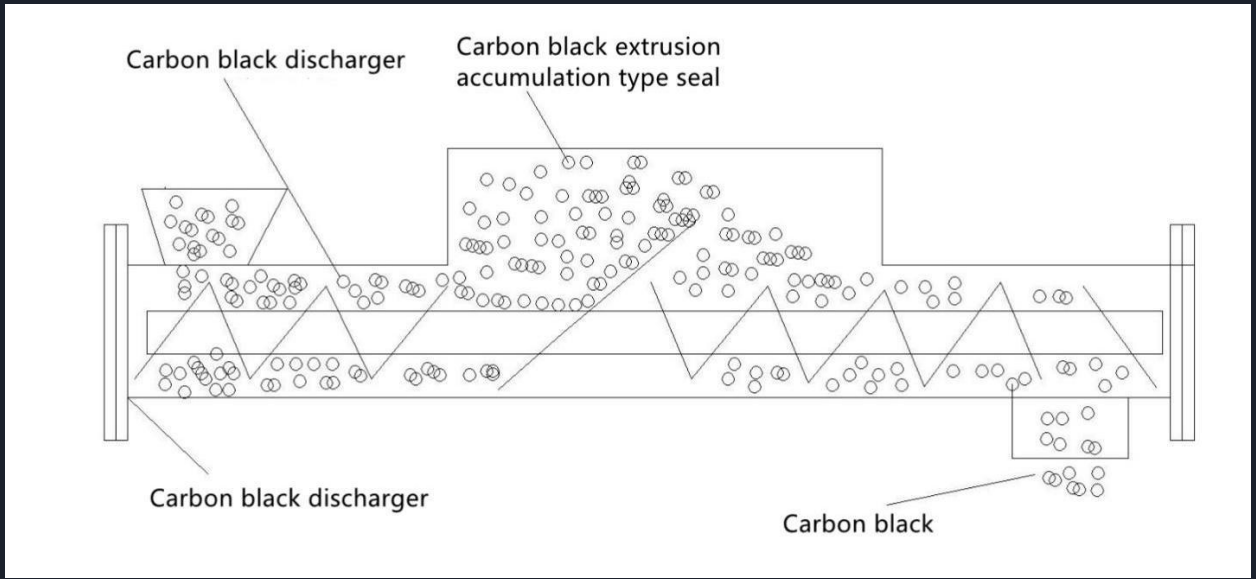


2. Equipped with innovative drive and dragon-separated indirect transmission technology, the operation is highly sealed and leakless. The structure is characterized by fixed power height and concentric rotation, aligning rotation of the reaction auger, and automatic transmission through the coupling, which will not cause oil and gas leakage due to winding of the reaction auger, and completely solves the problem of serious air leakage caused by deformation and bending of the high temperature reaction auger and direct connection of the whole shaft with the power.



3. Equipped with innovative "explosion-proof film and automatic valve opening and closing integrated safety device". The basic structure of the equipment is: the automatic blasting film and automatic opening and closing valve combined that can overpressure self-detonation, automatic closure after blasting, to ensure the safety of equipment operation

4. Supporting innovation "accumulation extrusion sealing technology". Using this technology can make the feeding and discharging more safe. The basic structure is setting extrusion device in the auger equipment, to promote the material self-dense accumulation and release, to ensure that the material has no gap and no leakage, perfect to achieve a high automatic sealing effect.



Innovative heat recycling technology, more energy saving. "Heat recycling technology" is mainly to effectively use waste heat to achieve energy saving. Smoke from chimneys can reach temperatures as high as 350 ° C, which would be wasteful if emitted directly. In this technology, the flue gas circulation device is set in the pyrolysis heating system, so that part of the flue gas is recovered and heated again into the heating furnace and mixed with fuel. The other part of flue gas is through the air preheater to heat the air at the entrance of the burners to about 100℃ and then into the furnace, through this energy saving measure, can effectively save energy by about 30%.

Innovative reflector heating technology, more durable equipment. The high temperature gas is not in direct contact with the equipment, but radiates heat to the equipment through a reflection furnace, which completely avoids the phenomenon of unbalanced heating of the equipment. Not only does the equipment have a long service life, but the fuel burns more fully when it runs repeatedly inside the reflection furnace.

Innovative conversion agent technology, more environmentally friendly emissions. Waste tires contain certain sulfur compounds, which will be separated when pyrolysis, and will directly pollute the atmosphere and mix into the oil, which will affect the quality. With the use of composite converters, the sulfides can be replaced with non-evaporative substances, thereby minimizing the effect of sulfides.

Innovative jet balanced low negative pressure operation is more reliable. It is beneficial to adopt proper low micro negative pressure in the reactor system during pyrolysis. First, it is beneficial to the evaporation fluidity of pyrolysis oil and gas. The second is to prevent the leakage of oil and gas. The company has changed the traditional method of using vacuum pump to pump air (direct vacuum pump is unstable and unreliable), designed the jet balance type low negative pressure scheme, so that the negative pressure is absolutely stable, to ensure that the negative pressure will not exceed the standard at any time, and will not be dangerous because of excessive air inhalation.

VII. PRODUCTS FROM PYROLYSIS PLANT (FROM WASTE TIRES BEFORE SHREDDING)

1. Pyrolysis oil

- Can be sold directly, widely used in ceramic factory, cement factory, steel factory, hotels, etc,
- Part of it can be used back to pyrolysis machine for heating the reactor,
- Can be refined to be non-standard diesel, can be used in the diesel generator, boat, and other heavy duty low speed diesel engines.
- Can be used directly in the heavy oil generator to get electricity.

2. Carbon black

- Can be pressed to be briquettes and used as fuel ,
- Can be further processed to be higher quality, and used as fortifier and filler of plastic and rubber industry or as color masterbatch.

3. Steel wire

- Can be sold directly

4. Syngas

- Will be recycled to the furnace for heating the reactor

VIII. EQUIPMENT LIST

No.	Name	Specification	Qty.	Remark
Feeding system				
1.1	Feeder	φ425X6500/235B	1 set	
1.2	Feeding motor	7.5 KW	1 set	
1.3	Speed reducer		1 set	
1.4	Frequency converter		1 pc	
Pyrolysis System				
2.1	Continuous Pyrolysis Reactor	φ1600*L26000mm	1 set	Q345R
2.2	Driving motor	11kw	1 pc	
2.3	Speed reducer		1 set	
2.4	Frequency converter		1 pc	
2.9	Big & small roller		6 sets	3 sets of big 3 sets of small
2.10	Syngas burner		8 pcs	
2.11	Oil/gas burners	300,000 kcal/h	8 pcs	

Carbon black auto discharging system				
Feeding system				
3.1	First discharger	φ425X6500/235B	1 set	
3.2	Secondary discharger	φ425X7500/235B	1 set	
3.3	Third discharger	φ425X7500/235B	1 set	
3.4	Motor	7.5kw	3 pcs	
3.5	Speed reducer		3 pcs	
3.6	Frequency converter		3 pcs	
Heat Exchanging System				
4.1	Oil gas separator	φ1600*L26000mm	1 set	235B
4.2	Oil Condenser	11kw	2 sets	235B
4.3	Heavy oil tank	φ1000X3000/235B	1 set	235B
4.4	Light oil tank	φ1000X3000/235B	1 set	235B

Syngas purification system				
5.1	First hydroseal	Ø800x1500mm	1 set	235B
5.2	Secondary hydroseal	Ø800x1500mm	1 set	235B
5.3	Third hydroseal	Ø800x1500mm	1 set	235B
Emission Purification System				
6.1	Denitration purifier	Ø1400x3750/Q235B	1 set	
6.2	Secondary desulfurizer	Ø1400x3750/Q235B	1 set	
6.3	Draft fan	37kw	1 set	
6.4	Desulfurizing Tower	φ2000xH500	1 set	
Control system				
7.1	Control cabinet		1 set	

Others				
8.1	Bearing	Complete set	1 set	
8.2	Flange	Complete set	1 set	
8.3	Temperature meter	Complete set	1 set	
8.4	Oil pump	2.2kw	1 set	
8.5	Furnace Casing	Match with reactor	1 set	
8.6	Furnace base	Match with reactor	1 set	
8.7	Water pumps	5.5kw*2pcs, 2.2kw*2pcs	4 set	
8.8	Cooling tower		2 sets	

IX. QUOTATION

Model	Fully Continuous Pyrolysis Plant
Unit price	FOB USD 1,976,500
Quantity	3 sets
Total price	FOB USD 15,929,500
Container required	6*40 FR + 18*40HC
Delivery time	90 days
Valid period	30 days
Payment terms	30%TT in advance, 70%TT before delivery

X. AFTER SALE SERVICE

- Solution designing, technical and financial proposal preparation, and market analysis,
- Provide installation, commissioning and training service, has a professional team for after-sale service, the buyer needs to undertake the engineer's round trip tickets, local accommodation, and pays the engineer with salary USD150 per day,
- All the products from Mingjie has 12 months warranty since clients sign the act of acceptance,
- Lifetime technical support, technology upgrading from R&D department,
- 24 hours on-line service.

XI. SAFETY DEVICE ON THE EQUIPMENT

1) Leakage prevention: the equipment adopts a fully airtight structure, all dangerous pyrolysis process are operated in the airtight system, reactor and other equipment weld 100% qualified for nondestructive testing; Before leaving the factory, the equipment shall be checked by air tightness test to ensure that all flange connections, threaded connections and welds and other parts have no leakage. Pipes and other connecting parts installed on site should also pass the air tightness test before they are put into use.

2) Prevention of overpressure: the safety valve is installed on the gas outlet section of the reactor, and the pressure is relieved instantly through the safety valve (or the automatic blasting pressure relief of the blasting film) to prevent damage to the equipment and other equipment and cause accidents.

3) Anti-static: according to the relevant requirements of national standards, the anti-static device is set up, which can guide the accumulated static electricity of the equipment body away in time to prevent the explosion caused by static electricity; All personnel entering the device should wear anti-static work clothes; It is suggested that Party A set an anti-static grounding column outside the device, and all personnel should touch the electrostatic grounding column with their hands before entering the device area to eliminate human static electricity.

4) Isolation of oxygen: when the machine is running, the small positive pressure is maintained in the reactor to ensure that the outside air cannot enter the reactor and avoid causing explosion. Especially in the oil and gas output section, the outlet pipe is highly sealed through the sealing sleeve to ensure that the middle section of the sleeve is filled with peristaltic sealant at all times

5) Real-time monitoring of pressure and temperature: pressure gauges and thermometers are installed in key parts such as the reactor, which are regularly inspected by the operator, so that the pressure and temperature inside the equipment can be observed in real time. Once abnormal conditions are found, step-down and cooling measures can be taken in time to intervene.

6) Equipment of fire fighting facilities: the user shall, in accordance with the provisions of relevant fire fighting laws and regulations, equip the installation area with fire extinguishers, fire water guns and other fire fighting facilities (this part requires the user to configure on site).

7) Backup power supply and water source: During the operation of the device, if the power is cut off suddenly or the water is cut off, the temperature and pressure of the device may rise abnormally. It is suggested that the user should provide backup power supply and water source, that is, install double power supply and double water source system.

XII. INSTALLATION CASES


REDMI NOTE 9 PRO


SC-4213


油气分罐
一级冷却器
重油罐
轻油罐