YUSHUNXIN
GLOBAL TRADE AND INDUSTRY

河南豫顺鑫科技重工有限公司
Henan Yushunxin Heavy Industry Technology Co.,Ltd.

Pyrolysis Plant for Utilization and Recycling of Chemicals, Oil Sludge, and Other Wastes

User Manual

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Oil sludge pyrolysis equipment instruction manual

Dear user:

Welcome to use the oil sludge pyrolysis equipment manufactured by our company. It is currently the most advanced equipment for treating oil sludge in China and the world. The equipment adopts a scientific and closed production process, has the function of turning waste into treasure, and does not produce secondary pollution. After loading the oil sludge into the rotary reactor, tighten the feed door (load according to the equipment production capacity), and operate according to the operating procedures, you can safely and smoothly get the oil products. During the entire production process, the waste gas generated is sent to the furnace for combustion. The waste produced by this kind of condensation at room temperature will not be discharged into the atmosphere. At the same time, the soot burned in the furnace will be treated by the most advanced dust removal device. The oil sludge pyrolysis equipment manufactured by our company has excellent configuration, maximizes the use of energy, and obtains greater thermal efficiency with less combustion value. This is our company's unique advanced combustion high-efficiency utilization process, as well as a unique horizontal rotary structure, advanced automatic slag technology, etc. are all unique. Our company's technicians will provide you with a full range of after-sales service.

I. Trial run:

1. Add 1-1.5T of water to the reactor, and heat the furnace with diesel for 12-18 hours to prevent the refractory solid material in the hall from pyrolysising, deforming, and falling off. After 18 hours, the temperature gradually rises. When the pressure rises to 0.06Mpa, check whether there is leakage at each welding point. If there is leakage, it should be repaired in time. If problems are found, they should be solved in time. After the pressure test is completed, the pressure should be discharged to normal pressure, and the solid bolts of all heated parts should be fully

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searched and checked. All instruments and transmission parts should be checked one by one, and problems should be eliminated in time.

2. Check water, electricity and oil:

Water: Check whether the water pressure and flow of the water supply source (water pump or other water supply) meet normal use, and whether all condenser water tanks, water seals, etc. are filled with water as required and are in normal working condition;

Electricity: Check whether the voltage is normal and whether all electrical appliances are normal;

Oil: Check whether the equipment that needs to be greased, such as reducer, induced draft fan, roller, etc., is greased.

3、Check all welding parts:

Add about 1-1.5T of water to the rotating reactor, heat it with warm water to check whether there is leakage in the entire production system. If any leakage is found, it should be repaired in time. It is required to test with water for no less than 2 times (test whether the pressure is normal).

4、Feeding and debugging:

Suggestion: The amount of material added to the first and second furnaces should not exceed 60% of the maximum capacity (the liquid level of the solid raw material after melting and the liquid material level are 80mm below the oil and gas outlet as the maximum capacity). It is recommended to use light fire to heat the entire debugging process to prevent the solid material in the furnace from pyrolysising due to excessive temperature difference. Formal material feeding, feed according to the processing capacity requirements, generally adopt a gradual and progressive approach to achieve the normal level of production capacity. Such a gradual approach is beneficial to our production operators and equipment operation. Because production operators need a skilled process, and equipment also needs a running-in period.

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II. Normal production:

1、Turn on the rotary reactor so that it is in the direction of pushing the material to the feed port, light a fire in the furnace, start the induced draft fan, and turn on 1-2 exhaust gas burners to deal with the odor of residual combustible gas and water vapor in the system. The operator should always observe the working conditions of the thermometer and pressure gauge. Generally, there is no pressure. When the pressure gauge shows 0.01MPa, reduce the fire control and turn on a spare burner to burn and reduce the pressure. In some cases, it cannot exceed 0.04 Mpa. If the pressure exceeds 0.04Mpa, all spare exhaust gas burners should be opened in time to burn and reduce the pressure (if the pressure cannot be reduced, the drain valve should be opened in time) to keep the rotator and related systems at normal pressure, and pay attention to the flame length and flame color of the burner at any time. Generally, light blue and yellow-white are appropriate. Otherwise, it should be the burning of light component oil. If light component oil is burned, you can analyze and check from the following situations, find out the cause, and deal with and correct it in a targeted manner.:

Remember! When turning on the exhaust gas burner, turn on the blower first and then the burner. When turning off the burner, turn off the burner first and then the blower.

1) The furnace temperature is too high and the temperature rises too quickly;

2) The cooling water temperature is too high:

3) The cooling surface area is too small:

4) The cooling efficiency is too low (ash is retained in the cooling system);

5) The cooling water flow rate is too low.

2、Determination and operation of the end of the working state of the rotary reactor:

When the firepower in the furnace is not reduced, the temperature gauge of the gas bag at the oil and gas outlet drops rapidly, and the temperature gauge on the

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main furnace rises rapidly, indicating that the thermal pyrolysising is basically completed, and the pyrolysising end operation procedure should be adopted:

① Extinguish the fuel in the furnace;

② Open and ignite the ineffective combustion chamber exhaust burner, and then close the effective exhaust burner in the furnace;

③ Open the furnace door to cool down, and the reactor continues to rotate;

④ Discharge the residual oil when the temperature on the gas separator drops to 80-100℃;

⑤ Discharge the slag when the main furnace temperature is below 80℃;

⑥ Open the feed door only when the main furnace temperature is below 60℃, and then carry out the next round of loading.

III. Security Check:

1、Observe the oil collecting pipe near the oil-water separator. When there is basically no oil coming out, combine the temperature changes of the gas separator and the main furnace to determine whether the reactor has been basically refined dry.

2、Before each furnace slag discharge, when opening the slag discharge door, all operators should wear fireproof work clothes, fireproof masks and fireproof gloves to prevent the furnace from not drying up and burning the operators in case of open flames. Note: Do not open the feeding door when the temperature gauge on the main furnace is above 80℃, and it is recommended to keep it below 80℃.

3. Automatic slag discharge: Open and fix the slag discharge door, put down the dust plate, and open the slag discharge door of the rotary reactor only when the furnace door temperature gauge indicates below 80℃, and then open the feeding door when the main furnace temperature is below 60℃. Wait for 5 minutes and then check the furnace status to determine whether to clean the sticky wall or continue feeding production.

Remember: the feed door must not be opened when discharging slag! ! !

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Note: During the safety inspection and slag discharge process, do not open the valves and feed doors related to the host system to prevent air from entering the host. Since there is a high temperature and residual combustible gas in the host, avoid convection and circulation. After the slag discharge is completed, close the slag discharge door and rotate the feed door to the top to enter the next round of production.

3、After each furnace production is completed, the permeability of the oil and gas outlet inside the rotary reactor and the sticking condition of the main machine should be checked. If there is sticking, it should be cleaned in time to prevent coking from affecting the heat transfer efficiency during the next production, damaging the metallographic structure of the main furnace steel and reducing the service life of the main furnace (open the inspection port of the gas distribution bag to check the permeability of the oil and gas outlet). If there is dust accumulation, it should be cleaned in time.

IV. Precautions:

1. The main body of the rotary reactor must not be dry-burned or burned red at any time;

2. The water in the water seal must be replaced every two furnaces, and the water level must be kept at the required position;

3. Because weak acid gas will be generated when the exhaust gas is burned, please do not let the torch burn the furnace body;

4. At least two exhaust gas burners should be opened during the entire production process;

5. The medium temperature at the inlet of the induced draft fan should not exceed 150 degrees (because the metallographic structure of ordinary steel will change at 200 degrees)

6. The induced draft fan needs to be opened according to the situation to deal with the dust on the impeller to ensure the normal operation of the induced draft fan (if

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the induced draft fan has an abnormal rotation sound, the fan housing should be opened to clean the impeller. If it cannot return to normal, the impeller should be balanced or replaced in time);

7. The coking situation in the rotary reactor should be checked frequently and cleaned in time. When abnormal conditions occur during the production process, such as a significant decrease in oil output or a significant increase in the working time of each furnace under normal firepower, and other unexpected situations, if the raw materials have not changed, it can be preliminarily judged that coking has occurred in the rotary reactor. When similar situations occur, it should be cleaned in time after the furnace is shut down. When the rotary reactor is in production and a large amount of oil is discharged, the secondary power supply should be turned on to complete the production when a long power outage occurs. If other accidents cause the reactor to stop working for a long time, the materials that are not completely pyrolysised in the furnace should be checked in time during production and the reactor should be cleaned;

8. Regularly check the safety and reliability of all safety valves;

9. Regularly check the sensitivity and reliability of thermometers and pressure gauges;

10. Regularly check the water level in the dust removal room and do a good job of descaling;

11. When there is a power outage, open the furnace door to turn off the flame and close the gas combustion valve. (If the exhaust gas burner is turned off, the system will be pressurized and a way out should be provided for the exhaust gas. Open the drain valve to relieve the pressure);

12. When the water supply is cut off, open the furnace door, stop the fire, and manually open the gas valve (open the ineffective burner and close the effective burner);

13. When the air supply is stopped, open the furnace door and stop adding fuel;

14. When the water supply, power supply and air supply are cut off at the same time,

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the furnace door should be opened, the fire should be turned off, the ineffective exhaust gas burner should be turned on, and the effective exhaust gas burner should be turned off. Re-production and slag discharge and other measures should be determined based on the length of time;

15. Dry burning is not allowed to avoid damage to the main furnace and affect the service life;

16. If the temperature gauge of the main furnace is significantly different from the temperature gauge on the gas bag, and the temperature gauge on the main furnace heats up quickly, while the temperature gauge on the gas bag cools down quickly, the reactor should be turned off in time. This phenomenon indicates that the material in the reactor has been pyrolysised and the pyrolysising operation procedure needs to be terminated;

17. Wait until the temperature of the main furnace drops to 130 degrees before stopping the rotation to avoid static thermal deformation;

18. Check the blockage of the cooling system regularly according to the special raw materials used, and deal with it in time to ensure normal production status;

19. Please note that customers should never use raw materials that can produce corrosive gases, such as PVC plastics;

20.We hope that customers will abide by the operating procedures and not violate the regulations. Read the equipment manual in detail before operation.。

V. Brief description of all system components and electromechanical equipment

(I) Simple operation of the rotary processor:

The transmission system of the rotary processor consists of:

A.Reducer

Regularly check the gear oil in the reducer, the operation of the reducer, and the fixing of the reducer parts. If there are welds or cracks, they should be repaired in time.

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B. Roller

Check the heat-resistant grease in the rollers. If it needs to be replaced, it should be replaced in time. If the tugboat is damaged, lift the rotating body with a jack to replace it. Note: When using a jack, the jack should be placed flat, and safety precautions should be taken.

C. Check the working condition of gears and gear rings regularly, and lubricate them with high-temperature grease regularly. If damaged, repair or replace deformed parts in time.

D. Rotating processor inner chamber

The inner chamber wall should be checked frequently for coking. If there is ash with a thickness of more than 5mm stuck on the inner wall, it should be cleaned up in time to prevent the heat transfer effect and burning in the next production. After burning, a barrier layer that affects heat transfer will be formed.

E. The sealing strips on the feed door and slag discharge door should be replaced regularly depending on the situation.

F. The sealing packing at the dynamic and static seals of the oil and gas outlet should be supplemented and replaced.

(II) Gas distribution bag:

1. Check the dirt accumulation at the bottom of the air distributor regularly and deal with it in time if safety conditions permit.

2. Check whether the temperature gauge and pressure gauge on the air distributor are working normally.

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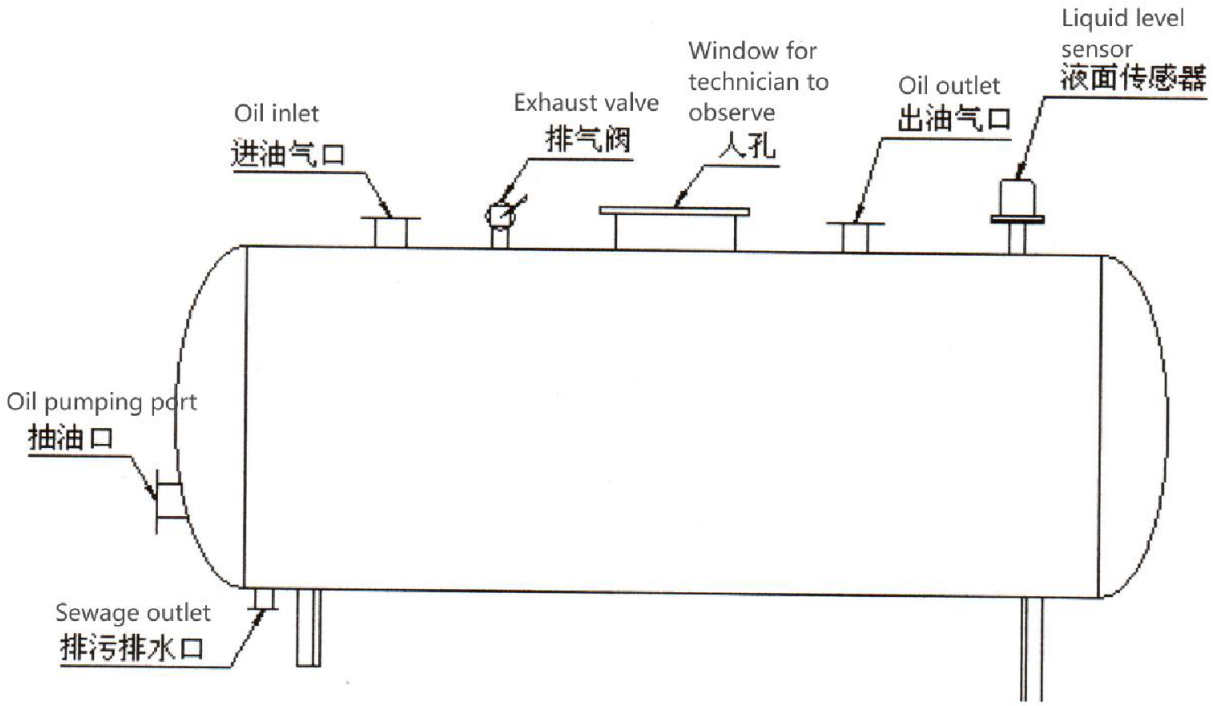

（III）、Cooling system

Open the blind plate of the damping tank frequently to check and clean it. If the pipeline is blocked, clean it in time.。

(IV) Oil-water separator

1. Check the drain valve regularly to see if it is in good condition.

2. If you want to drain the water in the oil-water separator, open the exhaust valve.

3. After draining the water, pump out the oil and keep the drain valve open when pumping the oil.

4. After pumping the oil, close the drain valve.

5. Do not open the exhaust valve when pumping oil out during the production process.

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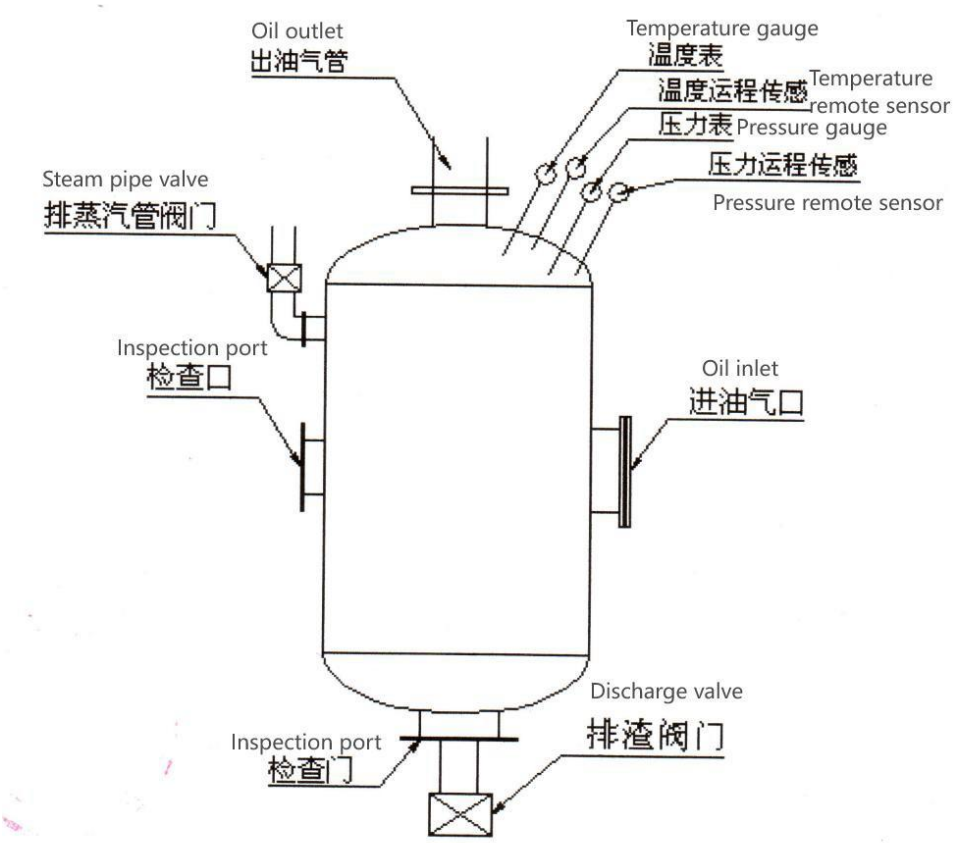

(V) Water seal

1. The water in the water seal should be replaced every few furnaces. (Open the overflow port when filling water, close the water filling valve when water flows out of the overflow port, and then close the overflow port valve when the water stops naturally)

2. Check whether the safety valve is in normal condition and the pressure gauge is in normal condition.

3. Check the pressure of the water seal during normal operation. If the pressure is abnormal, find out the cause and take corresponding measures in time.

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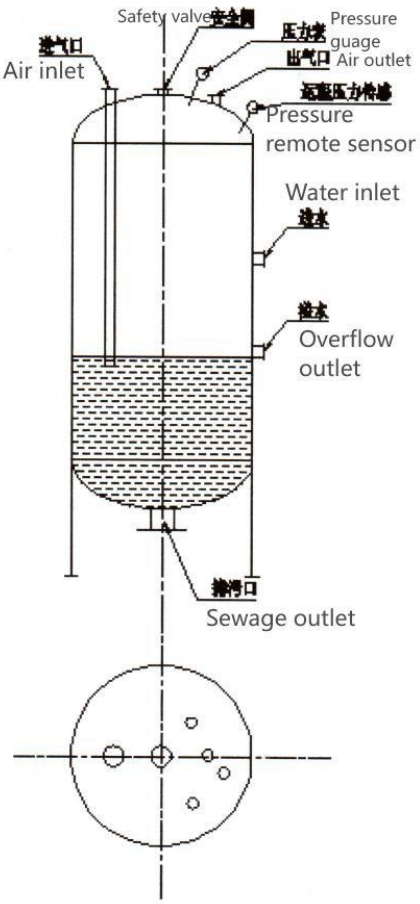

(VI) Gas spray gun

If the torch burns small or abnormally, the nozzle should be opened to check whether the jet is blocked. When the gas volume is small, the air inlet should be adjusted accordingly until the torch can be formed.

(VII) Blower

Do not allow foreign matter to enter the blower during operation to avoid unnecessary losses.

Pay attention to frequently check whether the bearing parts are short of oil. It is recommended to use lithium-based high-temperature gear oil that can withstand temperatures above 320 degrees.

(VIII) Draft fan

1. The temperature of non-standard self-made medium shall not exceed 150℃.

2. After the induced draft fan has been running for a period of time, open the square

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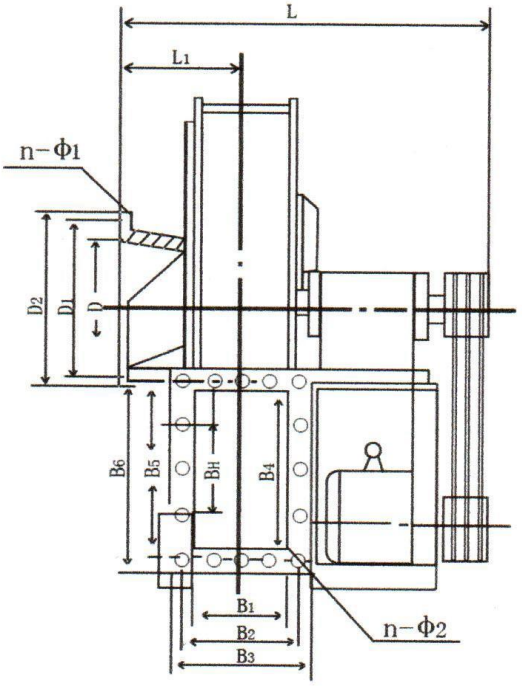
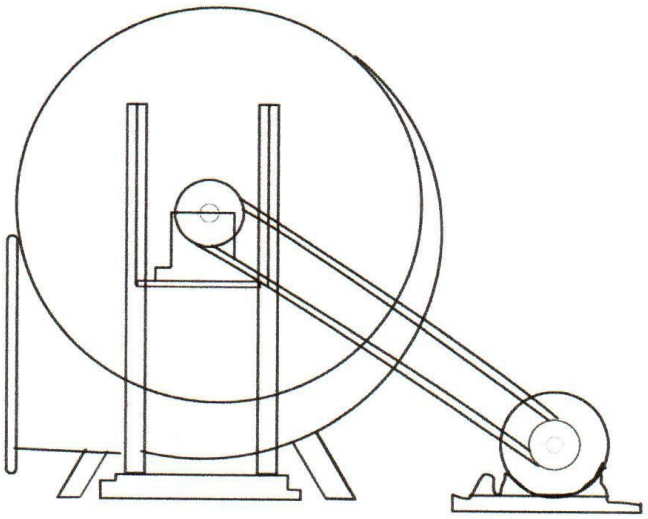
inspection door on the casing to check the smoke and dust adhesion on the impeller blades and clean them in time.

3. If there is abnormal vibration and noise during the operation of the induced draft fan, it should be checked and handled in time.

4. The residual oil reducing agent should be added to the bearing chamber regularly.

5. Adjust the tightness of the V-belt to maintain the transmission efficiency of the V-belt.





(IX) The pressure gauge and the temperature gauge should be checked regularly to see if they are normal. The pressure gauge should be calibrated by the metrology department according to the prescribed inspection cycle. The temperature gauge should be inspected regularly (the safety valve should be inspected regularly according to the relevant regulations of the boiler inspection institute). The remote pressure and temperature sensor needs regular maintenance to ensure normal use.

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VI. Operation process:

1. After loading, tighten the furnace door and slag outlet bolts, turn on the rotary reactor, and check whether the rollers, reducers, fans, water pumps and display instruments are operating normally.

2. Start ignition. The fire should not be too high at the beginning of production. When heated to 150℃-170℃, it is necessary to start controlling the fire size and temperature, so that the heating process proceeds slowly, and the air bag temperature gauge is controlled between 280℃-320℃ (if the fire is too high, pressure will be generated and the color of the oil will turn black).

3. When the temperature of the main furnace rises and the temperature of the gas bag drops, the oil output from the oil sight glass decreases significantly (that is, the pyrolysising process is about to end). Start to increase the heat until the gas bag temperature drops to 120℃-140℃, and the main furnace temperature rises to above 450℃ (lasting about 30 minutes). Extinguish the fuel in the furnace, open the water seal drain valve, and then close the gas spray gun in the furnace. When the gas bag is cooled to 80℃-90℃, discharge the residual oil. When the temperature of the main furnace drops below 80℃, slag can be discharged (when opening the slag outlet, the staff should not face the slag outlet directly, leave a bolt and do not loosen it, use a long hook to hook the slag cover, and only when there is no danger can the workers loosen the bolts and open the slag outlet to discharge the slag. When slag is discharged, all staff should stay away from the slag outlet to avoid accidents). When the main engine cools down to normal temperature, the furnace door can be opened to load materials and proceed to the next working process. 4. Note: If the temperature of the main furnace rises to 450℃, and the temperature of the gas bag cools down slowly or rises, it is necessary to continue heating the main furnace until the temperature of the gas bag drops rapidly to 120℃-140℃ before stopping heating.

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Measures to prevent fire

I. Fire conditions:

1. Oxygen 2. Combustible materials and combustible gases 3. A certain temperature

II. Do not allow these conditions to be met at the same time

1. Try to dry the raw materials in the furnace
2. Lower the temperature
3. Do not allow the air to form circulation, convection, or reflux, that is, close other valve inspection doors when opening the slag door.
4. The feed door should be opened gradually, first open a little to release the combustion and exhaust gas, then open a little more, and then open it wider according to the situation.
5. The operator should stand at a safe angle and a certain distance, and should not stand at the symmetrical angle of the door gap when opening the door.

III. Prevent sticking to the wall

1. Adding some steel wire to the liquid material will prevent it from sticking to the wall, and the cleaning frequency should be determined according to the amount of impurities contained.
2. Timely treatment of sticking to the wall is the guarantee for extending the service life of the main furnace and continuous production.

The PYROLYSIS PLANT is suitable for treatment of:

1. Oil sludge, drilling mud waste, drilling fluid, oily water; sand and/or soil and/or clay mixed with oil sludge and drill cuttings, oil based fluid, liquid water based mud (WBM) waste containing chemicals, thick water based mud (WBM) waste containing chemicals, sand mixed with alkaline water and all other waste items, excluding the waste classified as: Class 1 – Extremely Hazardous

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Waste;

2. Plastics (Thermoplastics), Polyethylene (PE), Polypropylene (PP), Polystyrene (PS), Mixed plastic waste (non-halogenated), Packaging films and containers, Used Tires and Rubber Waste, Car and truck tires, Conveyor belts, Rubber seals and gaskets, Oil Sludge and Oily Waste, Tank bottom sludge, Waste lubricants, Municipal Solid Waste (MSW) Components, Non-recyclable plastic, Dirty paper and textile, Organic residues (in some technologies);

3. Oil and other filters; waste mineral and other oils, including motor, hydraulic, compressor, turbine, cutting and other oils and diesel fuel waste, waste of other types of catalysts, sorbents, filter materials and fibers,waste synthetic and semi-synthetic oils;

4. Residues of waste and sewage water and sludge, organic waste (pre-grinding), sawdust and wood shavings and all other waste, with the exception of waste related to "Class 1 - Extremely hazardous waste";

Note: Waste with corrosive and acidic properties is neutralized prior to processing using chemical reaction using appropriate methods.

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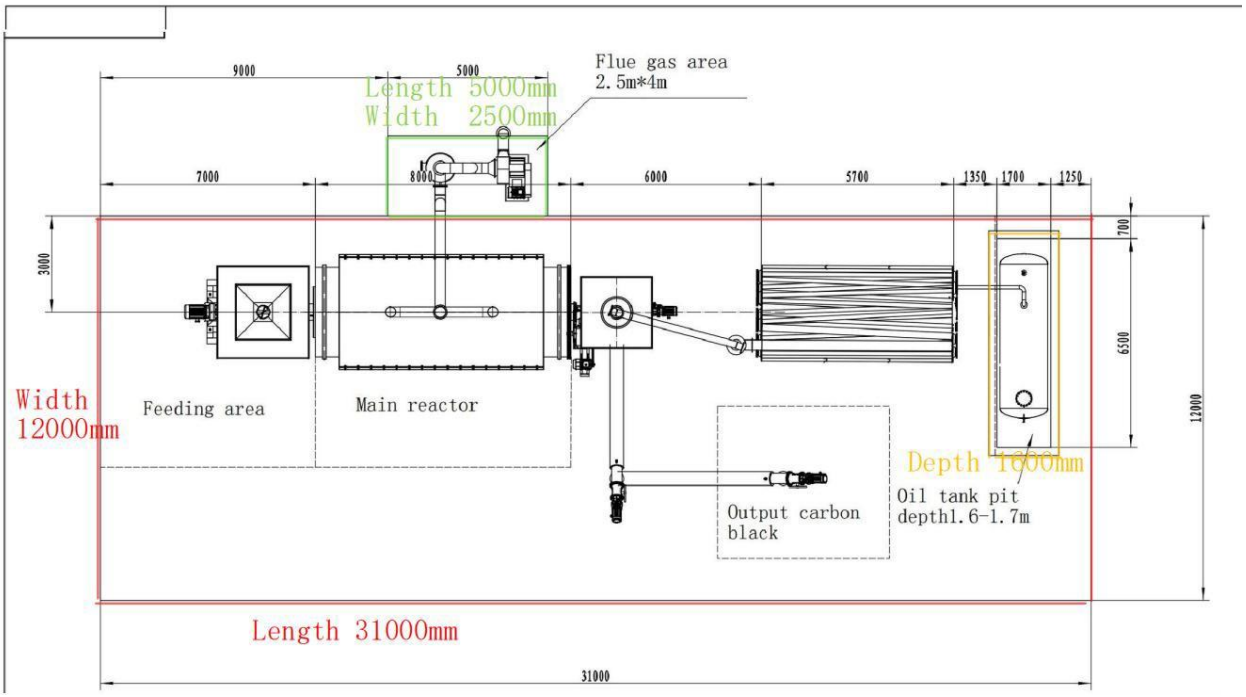
The drawing of Pyrolysis Plant



Noted:

Concrete foundation is recommended to be 30 cm thick(at least 20cm)

20mm thick rebar is used as the foundation below. Pull as many layers as possible.

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Power comsumption

Warer pump:2.2kw*1

Fan:3kw*1

Burner:0.4kw*4

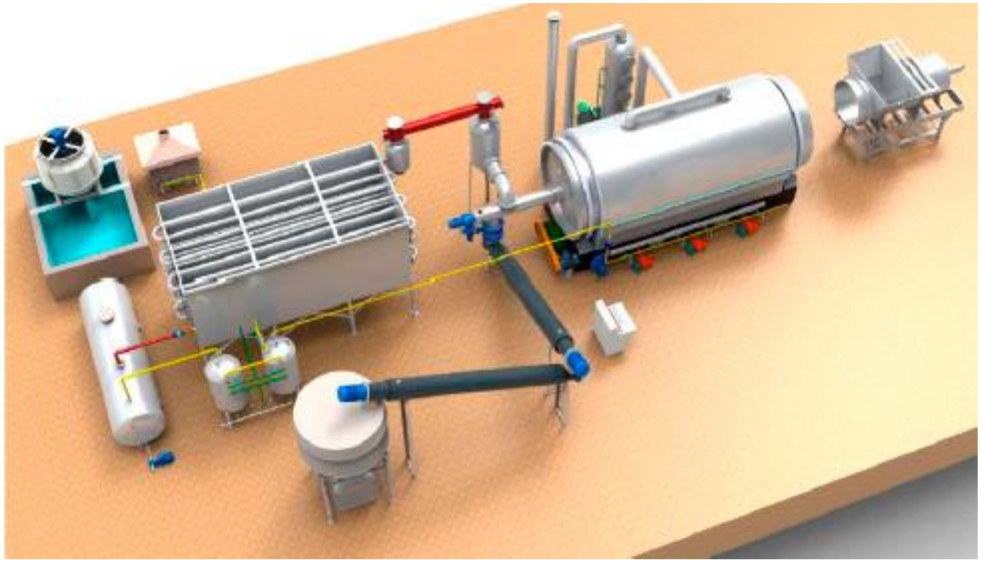
Hydraulic feeder:15kw*1

Oil pump:4kw*1

Furnace:7.5kw*1

Induced draft fan:5.5kw

Total comsumption:38.8kw



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