

TECHNICAL SPECIFICATIONS AND OTHER ALLIED REQUIREMENTS

SI No.	Description of items	Quantity
PUR/575583/ERT/SB/E/2019-20		
01.	Supply, Installation and commissioning of Waste Plastic Pyrolysis Plant to Process 50 kg Plastic Waste Per Batch and Convert it to Crude Oil. Raw Material: Plastic Waste From Segregated Municipal Solid Waste. Batch Processing Time: 8-10 Hours (Detail Specification as per Annex. I)	01 No.
02.	Supply, Installation and commissioning of Waste Plastic Pyrolysis Plant to Process 30 kg Plastic Waste Per Batch and Convert it to Pyrolysis Oil. Raw Material: Plastic Waste From Segregated Municipal Solid Waste. Batch Processing Time: 4-6 Hours (Detail Specification as per Annex. I)	01 No.

1. DELIVERY & INSTALLATION SITE / FINAL DESTINATION

- 1.1. The ordered goods as mentioned in SI. No. 01 above is to be Delivered, Installed and Commissioned at Amrawati, CRPF Group Centre, Durgapur – 713214, West Bengal.
- 1.2. The ordered goods as mentioned in SI. No. 02 above is to be Delivered, Installed and Commissioned at MSW Management Pilot Plant, CSIR-CMERI Colony, Durgapur – 713209, West Bengal.

2. WARRANTY

- 2.1. One Year onsite Warranty to be provided by the Successful Bidder from the date of Satisfactory Installation/Commissioning and Acceptance.

3. GST CONCESSIONAL CERTIFICATE

- 3.1 GST Concessional Certificate would not be issued by this Institute.

Annexure-I

Supply, installation and commissioning of waste plastic pyrolysis plant to process 50 kg plastic waste per batch and convert it into crude oil at Amrawati, CRPF Group Centre, Durgapur, West Bengal 713214

1 End user:

The waste plastic pyrolysis plant will be installed in Amrawati, CRPF Group Centre, Durgapur, West Bengal 713214.

2 Detailed specification:

a) Waste plastic pyrolysis plant

Sl. No.	Name of component	Description of item	Quantity
1	Pyrolysis reactor	Configuration: Horizontal stainless steel (SS304 grade with 8 mm thickness) reactor with tray type feeding mechanism. The outer insulation is jacketed with 80 mm thick ceramic wool and clad with stainless steel sheets for protection. Reactor capacity: 50 kg plastic waste Volume: 1.0 m ³ Furnace at the bottom for heating Thermocouple for temperature measurement at reactor door and furnace Thermocouple for temperature measurement within the heating zone. Automatic Pressure Release Valve Arrangement for Nitrogen / CO ₂ Purging for safety purpose Full door opening for feeding material using tray feeder With Mixing Geared Motor 3 hp 415V AC	1 no.
2	Heating system	Dual fired with two independent burners. One pyrolysis oil/LDO burner and one hydrocarbon gas burner. Pyrolysis oil/LDO burner will be provided with pumping unit comprising of 2 hp gear pump along with filter and a 20 L oil tank with intermediate piping	1 set
3	Condenser assembly	Shell and tube type heat exchanger with nozzles for vapor line and water from cooling tower (Inlet /Outlet) Oil receivers mounted on stand connected for oil collection All fabrication in MS and seamless tube of Sch. 40	1 set
4	Oil Water Separator	Capacity: 50 L (min) MOC: MS 5 mm Thickness. IS2062 Safety device to prevent flashback into the reactor	1 no.

Annexure-I

5	Hydrocarbon gas collection tank	Buffer tank to safeguard pressure build up with pressure relief valve and diversion to use the gas in reactor heating or flaring system Capacity: 100 L (min) MOC: MS 5 mm Thickness. IS2062	1 no.
6	Oil Receiver tank	Capacity: 100 L (min) MOC: MS 5 mm Thickness. IS2062	1 no.
7	Cooling Tower	Capacity 25 TR Fibre-reinforced plastic body 0.5 hp Water Pump for Cooling Tower of Crompton/Kirloskar Make 0.5 hp, 3Φ Circulation fan	1 no.
8	Chimney	ERW C Class Heavy duty pipe with bottom cone with diameter 150 mm, height 5 m and thickness 5 mm with canopy	1 no.
9	Control Panel	Manually operated with push button for burners, pumps, cooling tower fan, water pumps, flare unit ignition and digital meters for temperature and pressure monitoring.	1 no.
10	Plastic Shredder	Capacity: 50 kg/h Input material: Polyethylene bags, pet bottles, tetra pack etc. Motor: 5 hp, 3 phase with DOL starter switch Shredding size: 10 mm × 10 mm Blade: 2 set (additional)	1 no.
11	Flaring system for burning exhaust gases	Burner system with blower	1 no.
12	Oil filtration system	Filtration rating: 5 microns in 3 stages Capacity: 5 Lpm	1 no.
13	Diesel (Initial fill)		200 L

3 Scope of supply & incidental services:

a) Waste plastic pyrolysis plant

Detailed specification as Provided in Section 2 above.

The supplier shall be required to perform the following services:

- Installation & Commissioning, Supervision and Demonstration of the goods;
- Providing required jigs and tools for assembly required for the completion of the installation;
- Cabling from main panel to all instruments and devices;
- Onsite training to Scientists/Technical Officers/Staffs is to be provided by Supplier for operation and maintenance of the equipment to the complete satisfaction of the user department;
- All safety requirements are to be incorporated.

Annexure-I

4 **Inspection and Acceptance Tests required:**

Trial run and full load test will be conducted for 3 days to the complete satisfaction of the end user in the presence of Scientists/Technical Officers from CSIR-CMERI.

5 **Minimum Pre-Qualification Criteria:**

None

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20.12.19

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NA
20/12/19

Supply, installation and commissioning of waste plastic pyrolysis plant to process 30 kg plastic waste per batch (Batch processing time: 4-6 hours) and convert it to pyrolysis oil: 01 Unit

1) End user:

The waste plastic pyrolysis plant will be installed at MSW Management Pilot plant, CSIR-CMERI Colony campus as a part of the deliverable of the project "Design & development of self-sustainable integrated Municipal Solid Waste disposal system for bulk waste generator".

2) Detailed specification:

Sl. No.	Name of component	Description of item	Quantity
1	Pyrolysis reactor	<ul style="list-style-type: none"> • Configuration: Horizontal stainless steel (SS304 grade with 8 mm thickness) reactor with manual feeding. The outer insulation is jacketed with 80 mm (min) thick ceramic wool and clad with stainless steel sheets for protection • Reactor capacity: 30 kg plastic waste • Volume: 750 L (min) • Size: 600 (D) × 2600 (L) in mm (min) • Thermocouple for temperature measurement at the inside of reactor, outlet pipe of reactor, exhaust gas pipe and furnace • Pressure gauge in the reactor chamber and gas pipeline • Automatic pressure release valve arrangement for Nitrogen / CO₂ purging for safety purpose • Full door opening for feeding material 	1 No.
2	Heating system	<ul style="list-style-type: none"> • Resistive heating using electricity • Heating material: 3 mm Kanthal A1 wire or better • Heating type: 3φ 415V (AC) • Heating load: 15 kW (min) • Wiring from heater to control panel should be with multi strand copper flexible wire with fibreglass insulated 	1 No.
3	Condenser assembly	<ul style="list-style-type: none"> • Shell and tube type heat exchanger with provision for water inlet and outlet from cooling tower • The maximum temperature rise of cooling water in the condenser must not exceed 10°C • No. of stages: 4 (min) • Oil water separation tank mounted on stand connected for oil collection 	1 No.

		<ul style="list-style-type: none"> All fabrication in MS (IS2062) and seamless tube of Schedule 40 	
4	Oil Water Separator tank	<ul style="list-style-type: none"> Capacity: 100 L (min) MOC: MS IS2062 of 5 mm thickness Safety device to prevent flashback into the reactor The level of the tank should be such that the separated oil is transferred to the oil receiver tank without any pumping Tank level indicator mounted on side 	1 No.
5	Oil Receiver tank	<ul style="list-style-type: none"> Capacity: 100 L (min) MOC: MS IS2062 of 5 mm thickness Tank level indicator mounted on side Drain and discharge valve at bottom 	1 No.
6	Hydrocarbon gas collection tank	<ul style="list-style-type: none"> Buffer tank to safeguard pressure build up with pressure gauge, pressure relief valve and diversion to store the gas in storage tank or use it in flaring system Capacity: 200 L (min) MOC: MS IS2062 of 5 mm thickness 	1 No.
7	Cooling Tower	<p>Recirculating type</p> <p>Range of cooling tower: 5-10°C for an inlet temperature of 35°C</p> <p>Fibre-reinforced plastic body and reservoir with capacity of 150 L</p> <p>1.0 hp, 1φ water pump for recirculation of water (Make: Crompton/Kirloskar)</p> <p>1.0 hp, 1φ air circulation fan with canopy cover</p>	1 No.
9	Control Panel	Manual operation with push button switch and indication lamps for heaters, pumps, cooling tower fan, water pump, flare unit ignition and digital meters for temperature and pressure monitoring	1 No.
10	Flaring system for burning exhaust gases	Burner system with 0.5 hp blower	1 No.
11	Catalyst	Suitable catalyst must be provided to control the rate of reaction	300 kg

3 Scope of supply & incidental services:

a) Waste plastic pyrolysis plant - 30 kg/batch: 01 unit

Batch processing time: 4-6 hours

The supplier shall be required to perform the following services:

a) Complete installation and commissioning of the goods,

- b) Onsite demonstration to Scientists/ Technicians/ Staff is to be provided by Supplier for operation and maintenance of the equipment to the complete satisfaction of the user department,
- c) Supplying at least one number of operation & maintenance manual (hard printed copy) with the pyrolysis plant,
- d) Necessary cabling from control panel to each individual equipment items must be provided.

4 Inspection and Acceptance Tests required:

Trial run and full load test will be conducted for 5 days at CSIR-CMERI, Durgapur to the complete satisfaction of the end user.

5 Other Terms and Conditions:

- a) CSIR-CMERI, Durgapur shall conduct the inspection and/or test the goods to confirm their conformity to the Tender Specifications at vendor's premises (Pre-dispatch inspection).
- b) CSIR-CMERI, Durgapur reserves the right to inspect, test and, where necessary, reject the Goods after the goods arrival at the final destination shall in no way be limited or waived by reason of the Goods having previously been inspected, tested and passed by CSIR-CMERI, Durgapur prior to the goods shipment.
- c) The Director, CSIR-CMERI, Durgapur shall be the final authority to reject full or any part of the supply which is not confirming to the specification and other terms and conditions.
- d) No payment shall be made for rejected goods. Rejected goods must be removed by the supplier at their own cost and replaced within two weeks of the date of rejection.

6 Minimum Pre-Qualification Criteria:

None

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31.07.2020