Annexure-2

General specifications

S.No	Parameters	Required Specification
	Type of waste	Carbon and silica prepregs along with overwrapped plastic papers, fiber glass, silica and carbon cloth soaked with resin, Poly urethane foam, thermocol ,PF Resin mixed with saw dust, plastic paper ,Curing waste of resin mixed Jutes and Coir ,domestic dry waste from canteen and dry waste generated as part of day to day office functioning Etc. This type of waste contains 10% moisture,5% incombustible solids and has a heating value of about 4725kcal/Kg as fired.
	Capacity	125 Kg/hr
	Design temperature	1500°C
	Operating temperature	1100°C (±50°C)
	Waste Loading	Should have automatic waste feeding system so that there is no direct exposure of furnace atmosphere to the incinerator operator while charging.
	Ash door	Minimum Two Nos.
	Motors	shall be of continuous duty S1 type of IS: 325 standard(Latest version)
Primary Chamber:-		
	MOC	MS IS 2062 – 6 mm thick
	Design temperature	1500°C
	Operating temperature	850°C (±50°C)
	Ash door	Minimum one
	Refractory & Insulation	IS-8 refractory brick with high alumina content 115mm thick + IS2042 insulation brick 115mm thick +Ceramic Blanket 100 mm.

	Burner	Fully automatic with Burner retracting mechanism
	View Port	Projected type of observation or view ports (high-temperature glass with a metal closure provision) should be provided to observe visual condition of the burning process.
	Emergency Vent	The incineration system must have an automatic emergency vent designed with a provision of electric/pneumatic operated valves. The emergency vent shall remain closed and such provision it shall not emit flue gases or leakages during normal operation of the incinerator
	Painting	externally with heat resistant aluminium paint
Secondary Chamber		
	MOC	IS 2062 – 6 mm thick
	Design temperature	1500°C
	Operating temperature	1050°C (±50°C)
	Ash door	One
	Refractory + Insulation.	IS-8 refractory brick with high alumina content 115mm thick + IS-2042 insulation brick 115mm thick +Ceramic Blanket 100 mm.
	Burner	Fully automatic with burner retracting mechanism
	Painting	externally with heat resistant aluminium paint
	View Port	Projected type of observation or view ports (high-temperature glass with a metal closure provision) should be provided to observe visual condition of the burning process.
Burner		
	Type	Fully automatic pressure jet mono block
	No of burners	Two
	Fuel	High Speed Diesel (H.S.D)

Fuel Tank		
	MOC	IS 2062 – 5mm thick
	Capacity	900 Litres
	Accessories	Pipeline, Drain, Valves, Level Gauges, pump for fuel filling .
F.D Fan		
	MOC	MS IS-2062
	Motor rating	As per design
	Driven type	Centrifugal Direct Drive Type Air Blower with electric motor
Cyclone Separator		
	MOC	Outer Body made up of 5 mm SS 316 should have refractory and insulation castable lining inside. Outer cover in IS 2062 with air insulation in between.
	Dust Collection	Suitable provision for removal of the waste/Ash shall be provided
Quench Column		
	MOC	*Outer Body made up of minimum 5mm IS 2062should have refractory and insulation castable lining inside.*
Recirculation Pump With Motor		
	Type	As per process design with standby
	MOC	Wetted parts should be Stainless Steel (SS-316)
	Pipe MOC	Piping should be chemical resistant PPR
Venturi Scrubber		
	MOC	SS 316L with top & bottom cone
	Accessories	Pump, Strainers, Valves, Nozzles, Demister etc.
	Scrubbing media	Water circulation with 5% caustic soda
	Temperature	Out let -75 - 80°C
	Nozzle	SS 304 spiral type (Non-chocking)
Recirculation Pump With Motor		

	Type	As per process design with standby
	MOC	wetted parts should be Stainless Steel (SS-316)
	Pipe MOC	Piping should be chemical resistant PPR
Packed Bed Scrubber		
	MOC	Outer Body made up of minimum 5mm IS 2062should have acid proof tiles lining inside.
	Packing & Packing Holders	Scrubber should have FRP Lined Packing holders and ceramic packing with spray distributor with nozzles in SS 304
Recirculation Pump With Motor		
	Type	As per process design with standby
	MOC	Wetted parts should be Stainless Steel (SS-316)
	Pipe MOC	Piping should be chemical resistant PPR
Alkali Dosing System		
	MOC	wetted parts should be PP (polypropylene)
	Pump	Diaphragm metering type pump
Mist Eliminator/ Moisture separator		
	MOC	IS 2062 inside Rubber Lined (MSRL) of 5mm thickness
	Type	Cyclonic
Emergency Vent		
	MOC	IS 2062 inside refractory lining
Flue Gas Ducts		
	MOC	Should be of Cylindrical type and Material of Construction should be Partly MS and partly Mild Steel Rubber Lined.
I.D Fan		
	MOC	IS 2062 with inside FRP coating
	Impeller	SS 316 with dynamic balanced
	Drive	In-direct, V-belt
	No.of fan	2 Nos. (1No. Standby)

Chimney		
	MOC	IS 2062. Construction and thickness etc. as per IS 6533 (Latest). The Chimney should be protected from inside by providing 3mm thick rubber lining or with FRP.
	Height	Minimum 30 meters from ground level self-supported
	Working Platform	Two nos. with railings
	Accessories	Cage Ladder, Safety ring, Platform, Sampling point, Earthing GI, Lightning arrestor, Canopy, inspection window at bottom side, aviation light etc.
	Painting	Painted externally with at least two coats of heat resistance aluminium paint.
	Drain	Suitable provision shall be provided to drain condensate and same shall be connected to effluent treatment plant.
Painting		
	Painting	All the equipments& components should be coated with 2 coats of epoxy heat resistance paint
Panel Board		
	MOC	CRCA
	Safety	MCB fuses
	Voltage	440 V – 3 Phase
	Instruments	Temp controllers, thermo well
	Alarm	Buzzer audio type
Safety interlocks		
		Essential Safety interlock control should be incorporated with the incinerator system.
Effluent treatment plant with sludge drying bed		

	Effluent treatment plant	Appropriate treatment to the waste waters generated from a. Cleaning of waste storage areas and the facility; b. Cleaning of exhaust gases shall be provided. Also, the treated waste water shall conform to the waste water effluent discharge standards prescribed under the CPCB/SPCB norms. Design basis shall be provided along with the technical bid. The effluent treatment plant shall be Zero Liquid Discharge type (ZLD). The treated water shall be reused for the incinerator system. Elements required: Basic elements shall include a clarifier to collect and settle the effluent water, a bed for collecting slurry of sludge. Clear water from the clarifier shall be filtered through a battery of pressurised sand filter and activated carbon filter. The capacity of ETP shall be designed by the party appropriately to treat the entire quantity of effluents generated, on a daily basis. The design shall also consider necessary storage tanks for the collection/recirculation of treated effluent and also necessary pumps and its plumping accessories for reuse of the treated effluents for the operation of the incinerator. The overall responsibility of installing the ETP, including the civil works involved fully vests with the party. The party shall suggest any alternate method of effluent treatment other than mentioned above if applicable. The proposed method by the bidder shall comply to latest CPCB/ KSPCB effluent norms and shall be a proven approved method by CPCB. Party may also arrange a site visit to assess the functioning of the proposed effluent treatment method if commissioned elsewhere within India . The final design approval of effluent treatment method shall be under purview of VSSC.

	Sludge drying bed with solar evaporator system	Shall be provided with chemical resistant liner and top cover to avoid rain water entry.
	Accessories	All the accessories like effluent storage tanks, pumps, treatment tanks & treated effluent storage tanks, flow meters shall be chemical resistant.
Online Continuous Stack Emission Monitoring System		Following parameters shall be continuously monitored SPM, SOx, NOx, CO

Emission standards:

All the parameters should be within the limits prescribed in KSPCB/CPCB emission norms. Emission test by NABL accredited lab shall be carried out by the party after full commissioning of the incinerator. Test certificate shall be submitted.

Effluent standards

All the parameters should be within the limits prescribed in KSPCB/CPCB effluent discharge norms. The effluent treatment plant shall be Zero Liquid Discharge (ZLD). The treated water shall be reused for the incinerator system. Proposed effluent treatment details along with schematic layout shall be provided by the bidder.

Performance Test:

The system shall run for at least 3 days for 8 hours (each day) with rated output i.e. complete combustion of minimum 100kg/hr of mixed waste leaving no un-burnt things in the system to mark the successful commissioning of the system. Emission standards as per KSPCB/CPCB norms shall also form part of performance test.

Warranty and Services:

a. 2 year warranty for the total system shall be provided by the party. Replacement of spares, periodic maintenance once in three months and services shall be included in the warranty period. Any trouble shooting

support whenever needed shall be attended within 2 working days from the date of complaint.

b. List of Essential Spares shall be provided by the party for trouble free operation after the completion of warranty period. List of essential spares along with cost shall be quoted separately. The cost of essential spares shall not be considered for L1 Determination.

c. Party shall give an undertaking on their company letter head that spares support for the system for which bid has been submitted shall be provided for minimum period of 5 years.

d. Party shall impart training relating to the operation and maintenance of the equipment to staff nominated by VSSC.

Annual Maintenance Contract:

Party need to mandatory undertake non-comprehensive AMC after the expiry of the warranty period. The Party shall quote separately the charges for non-comprehensive AMC for Incinerator, APCDs and ETP for a period of 5 years beyond the warranty period. AMC shall have two periodical maintenance visits per year and breakdown visits as and when required. The cost of AMC shall not be considered for L1 Determination.

Guidelines for temperory power supply at site:

1. Electrical power supply at medium voltage (415 volt, 3phase, 4wire) for constructional purpose and general lightings will be made available at site or near site of work as per the direction of Engineer-In Charge at the point. The distance will not however exceed 50 mtrs from the building site. The contractor should lay down the power lines from this point at his own cost in an approved manner.
2. The contractor should pay the charges based on his power demands at current tariff rates prevailing at site as charged by supply authorities.
3. Suitable rated KWH meter will be supplied and installed by contractor and test certificate as per ISS from authorized test lab or manufacture is to be submitted.
4. The installation shall conform to Indian Electricity Rules, Indian Electricity Act 1910 and IEE Regulations as per the latest revisions and got executed by licensed electrical contractors only.

Documentation:

Post completion of work, successful bidder shall submit 2 sets of soft copies (on DVDs) along with three (3) sets of original prints in folders, of all the "AS-BUILT" drawings incorporating all changes that might have taken place during execution, Test certificates, datasheets. As-Built drawings shall be first copy and shall be properly arranged in suitable folders. Successful bidder shall also submit operation, maintenance, repair, testing and inspection manuals for the complete system in three (3) copies.

Delivery Schedule:

After receipt of a confirmed purchase order, successful bidder shall design, supply, install & commission the system and impart training to operators within a period of 28 weeks from the date of intimation received from VSSC based on site readiness subsequent to PO release.

	Mile stone	Schedule
T0	Receipt of confirmed purchase order by party	T0
T1	Submission of detailed design of Incinerator and ETP and civil works plan	T0 + 4 Weeks.
T2	Completion of design review by VSSC and the party.	T1 + 2 weeks.
T3	Completion of fabrication of Equipments and ETP and readiness for Pre delivery inspection Commencement and completion of civil works necessary for installation of equipments.	T2 + 18 weeks.
T4	Completion of Installation of Incinerator and ETP at our site.	T3+ 2 weeks
T5	Completion of commissioning activities and demonstration of the plant through 3 trials.	T4+ 2 weeks

Delivery Terms: F.O.R (Freight on Road) – VSSC(CMSE, VKC), Thiruvananthapuram, Kerala inclusive of P&F, Freight, Transit Insurance and any other charges to deliver, install &commission the system at VSSC, Thiruvananthapuram.

Qualification/ Eligibility Criteria

1. Bidder shall be Individual/ firm/ company/ corporate / limited company intending to bid should be bonafide, experienced, technically competent, resourceful and financially sound to carry out the assigned order. Copy of Company's registration / Certificate of incorporation/Partnership Deed/Any other registration certificate
2. Bidder should have successfully supplied, installed & commissioned at-least 1 no of 100 Kg/hr (or)higher capacity incinerator in any 1(One) year of last 5 (Five) years ending 31.12.2023.Copy of Purchase order / Work order / Agreement / Contract shall be provided.

   Party should also provide the list of such Installations with contact details to verify their performance if needed.
3. Bidder should have valid GST registration certificate. Copy of certificate shall be enclosed.
4. Bidder should have valid PAN card. Copy shall be enclosed.
5. Audited balance sheet and profit & loss statement for FY 2021-22, 2022-23 and 2023-24.

LIST OF STANDARD MAKES

1. Burners – Oroflam / F.B.R / Ecoflam (Italian makes) / Equivalent
2. Motors –Kirloskar / NGEF / Siemens / ABB / GEC /Crompton Greaves make
3. Pumps: Kirolslar, beacon, mather & platt , KSB
4. Temperature controllers - Delta/Selec/Equivalent
5. Refractory – Calderys / Equivalent
6. Wiring cables: RR Kabel / Havells / Finolex / Polycab

7. Pipes: From reputed manufacturers.
8. Tanks: From reputed manufacturers.
9. Starter : L&T, Siemens & Scheinder
10. Light fittings: Philiphs/Crompton/Wipro.
11. DB, ELCB, MCB, S/S:Legrand.
12. Casing capping, Mini trunking, PVC conduit: Precision/Legrand /Balco