

BIO-MEDICAL INCINERATOR (Capacity: 100 kg/hour or more) (The bidders shall have to quote Incinerator with standard accessories + Tamper-proof PLC + Data logger Control Panel + CHIMNEY + Weighing Machine (Digital) as a whole Package along with installation & commissioning & other requirement for the operationalisation of Unit)		
General		
1. Use		
1.1	Clinical purpose	Incineration of waste materials converts wastes containing elements of carbon, hydrogen, oxygen along with presence of other elements such as nitrogen, sulphur, chlorine and pathogens etc., can be destroyed completely by oxidation process using auxiliary fuel producing benign gases (flue gases) such as carbon dioxide, water, and nitrogen and some acidic gases such as oxides of sulphur, nitrogen, acids and other toxic gases such as heavy metals, Dioxins & Furans etc. as well as solid form of ash, depending upon waste constituents of the waste and performance of incineration system.
1.2	To be used by dept	
Standards and Safety		
2. Quality Standard relating to		
2.1	Product	a. Product should be CE / BIS approved product.
2.2	Manufacturer	a) Should be OSHAS 18001 & ISO 9001 certified for quality standards. b) Should be registered under the Factories Act, 1948 & Companies Act, 1956. c) Should submit documents certifying that the incinerator system has been designed and commissioned such the system can comply with the stipulated standards along with the latest monitoring results of the system as soon as commissioned. d) Should submit documents certifying that the incinerator system operating standards and emission standards are as per biomedical & waste management & handling rules 1998 under schedule V.
2.3	Electrical Safety	Electrical safety conforms to the standards for electrical safety IEC 60601-General requirements (or equivalent BIS Standard)
2.4	Test certificates	Test certificates from Govt. approved laboratory or NABL approved laboratory for Steel grade certificate (for SS 316 grade, SS 304 grade, Boiler grade and Mild Steel grade), epoxy coating, salt chamber test, bend test etc. should be furnished in the technical bid.
2.5	Calibration & QC	Certificate of Calibration from NABL / Govt. accredited lab, Internal QC passed test reports of previously supplied item.
Technical		
3. Technical requirements, desirable characteristics and features specific to this type of device		
3.1	Operational requirement	1) The incinerator should be fully automatic of controlled air & pyrolytic type. 2) Should have Electrical incinerator capacity of 100kg/hour or more 3) Should be fabricated with minimum 6mm Thick –IS 2042 & IS 2062 Grade Mild Steel (MS) castable refractory lined with required channels & Angles. 4) Should have automatic waste feeding & dishing system so that there is no direct exposure of furnace atmosphere to the incinerator operator while charging. Charging interval to be specified by the Manufacturer. 5) Ash cum maintenance doors for the chambers should be made of MS IS 2062 Grade Lining with High Grade Castable cement. 6) The incineration system must have an automatic emergency vent

		<p>designed with a provision of valves and a compressor. The emergency vent shall remain closed and such provision it shall not emit flue gases or leakages during normal operation of the incinerator.</p> <p>7) Each incineration system shall have graphic or computer recording devices which shall automatically and continuously monitor and record dates, time of day, batch sequential number and operating parameters such as temperatures in both the chambers as well as stack exit gas.</p> <p>8) Flue gas parameters such as CO, CO₂, and O₂ as well as other relevant parameters in gaseous emission as prescribed by the authority shall also be measured during the operation of the incineration using continuous emission monitoring system (CEMS).</p> <p>9) The possibility of providing heat recovery system/heat exchanger with the incinerator shall also be considered wherever possible or feasible.</p> <p>10) The incinerator should have alarm system to alert the incinerator in the event of power failure, non-operation of the Air Pollution Control Device (APCD), not maintaining adequate temperatures in primary and secondary chambers or in case of any emergency.</p> <p>11) APCD should comply standards as prescribed under BMWWM Rules, 2016.</p> <p>12) All the measuring devices attached with the incinerator should have digital display and should have provision of connecting to the recording system, which should include fuel meter and separate energy meter.</p> <p>13) All the measuring devices attached with the incinerator should have digital display and should have provision of connecting to the recording system, which should include fuel meter and separate energy meter.</p> <p>14) In case of wet air pollution control system, appropriate treatment to the wastewaters generated from</p> <ul style="list-style-type: none"> (i) Cleaning of waste storage areas and the facility; (ii) Cleaning of exhaust gases shall be provided. (iii) Also, the treated wastewater shall conform to the waste water effluent discharge standards prescribed under the BMWWM Rules.
3.2	<p>Both Primary & secondary Combustion chamber should have following technical characteristics</p>	<p>a) Shall be able to incinerate the waste so as to achieve the Total Organic Carbon (TOC) content in the slag and bottom ashes less than 3% or their Loss on Ignition (LoI) shall be less than 5% of the dry weight. The burners shall have automatic switching "off/on" control to avoid the fluctuations of temperatures beyond the required temperature range.</p> <p>b) Good quality Ceramic wool shall be used at all hot duct flanges & expansion joints.</p> <p>c) Type: Static Solid Hearth</p> <p>d) Fuel: Diesel (electrical Start and diesel fuel running thereafter).</p> <p>e) Temperature: 800 ± 50°C (for PCC) & 1200 ± 50°C (for SCC).</p> <p>f) Burners: 2 nos. (1 for PCC & 1 for SCC) of fully automatic Monoblock type.</p> <ul style="list-style-type: none"> (i) Each burner shall be equipped with spark igniter and main burner. (ii) Proper flame safeguard provision of the burner shall be installed. (iii) Burner retracting mechanism in both the chambers to safeguard the burners. (iv) The thermocouple sensor location shall be after tip of the burner and before exit of the incinerator chambers. (v) Provide projected type of observation or view ports (high-

		<p>temperature glass with a metal closure provision) should be provided to observe visual condition of the burning process. Neither heat nor flame, nor particles should be able to pass through the observation or view port.</p> <p>g) Mode of heating: electric heating coils that should be fully automatic in all respect</p> <p>h) Material of Construction: Made of IS 2042 grade mild steel materials of 5mm thickness duly lined with High Alumina Refractory Fire bricks (confirming to IS: 8-1994 & IS: 2042-2006 standard)& painted externally with heat resistant aluminum paint suitable to withstand temperature of 250°C with proper surface preparation and also the outside surface temperature of the incinerator casing being touched during normal operations should not exceed 45 to 50 °C above ambient temperature and should be provided with a safety measure in the form of a spikes or mesh around hot surface which will prevent direct touch. The sides and the top portion of the primary and secondary chambers shall preferably have rounded corner from inside to avoid possibility of formation of black or cold pockets/dead zones.</p> <p>i) Both Refractory as well as insulation thickness: 155 mm.</p> <p>j) Temperature resistance: 1400° C</p>
3.3	Painting :	All the equipments& components should be coated with 2 coats of epoxy heat resistance paint.
3.4	Safety interlocks :	Safeties and interlock control should be incorporated with the incinerator system.
4. Description of each Associated part / peripheral / Module / component		
4.1	Combustion Fan:	<p>a) The F.D Fan should be of Centrifugal Direct Drive Type Air Blower with electric motor.</p> <p>b) Modulation: Manual Damper Control</p> <p>c) Material of Construction: Mild Steel (MS).</p>
4.2	Quencher:	<p>To reduce flue gas temperature before Venturi Scrubber quencher should be provided having</p> <p>a) Outer Body made up of Mild Steel and</p> <p>b) Inside should have Refractory lining.</p> <p>c) Water circulation System should be provided with Centrifugal pump.</p>
4.3	Emergency Stack (1 set):	<p>a) Cylindrical Type,</p> <p>b) Top mounted on venturi ejector.</p> <p>c) Material of Construction should be Mild Steel of 3 mm thickness.</p> <p>d) Refractory-75mm thick castable and</p> <p>e) Insulation –25mm thick castable.</p>
4.4	Oil Tank (1 set):	<p>a) Should be made up of Mild Steel</p> <p>b) Capacity: 50 Litres or more</p> <p>c) It should also have Diesel Oil Level indicator, Oil Piping with valves & N.R Valves with visual checking of Fuel.</p>
4.5	Venturi Scrubber (1set):	<p>a) Should be High Pressure Jet Type</p> <p>b) Material of Construction should be Stainless Steel (SS-316L).</p> <p>c) Scrubbing medium should be Water with 5% caustic and</p> <p>d) Temperature at the outlet 78 °C to 80 °C.</p>
4.6	Recirculation Pump With Motor (1set):	<p>a) Should be Mono block Type</p> <p>b) Material of Construction of wetted parts should be Stainless Steel (SS-316).</p> <p>c) Piping should be chemical resistant PPR (polypropylene random</p>

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		copolymer)
4.7	Droplet Separator cum Recirculation Tank (1 set):	To separate water droplets from flue gases droplet separator should be used. a) Should be Vertical cylinder type and cyclonic. b) Material of Construction should be Mild Steel Rubber Lined (MSRL) with 3mm thickness. c) Should be MS plate fabricated of 6mm thickness with metal eliminators inside.
4.8	ID Fan with Motor (1set):	a) Should be High Pressure Centrifugal Belt Driven type. b) Material of Construction of casing should be Mild Steel Rubber Lined (MSRL) c) Material of Construction of Impeller should be Stainless Steel of SS 304 grade which should be connected with electric motor.
4.9	Alkali Dosing System (1 set):	a) Pump should be Plunger pump Type with metering. b) Material of Construction of wetted parts should be PP (polypropylene) c) Dosing medium should be NaOH solution.
4.10	Flue Gas Duct (Between Incinerator, Scrubber, ID Fan & Stack) (1set):	Should be of Cylindrical type and Material of Construction should be Partly MS and partly Mild Steel Rubber Lined (MSRL)
4.11	Manually Operated Dampers (2 sets):	Should be made of Mild Steel.
4.12	The incinerator should have instruction plates attached in a prominent location on the unit that should clearly address	a. Cleaning ashes and slag from the combustion chamber(s), b. Cleaning of combustion air openings before starting the incinerator (where applicable), c. Operating procedures and instructions like proper start-up procedures, normal shut-down procedures, emergency shut-down procedures, and procedures for loading waste (as applicable).
4.13	Permanent marking on the incinerator indicating	(i) Manufacturer's name or trademark (ii) Style, type, model or, date of manufacture of the incinerator (iii) Capacity and also in terms of net designed heat release in heat units per timed period (i.e., British Thermal Units per hour, mega joules per hour, kilocalories per hour).
5. Description of PLC, Data logger, Chimney and Weighing Machine (Digital)		
5.1	PLC for incinerator	1. A tamper-proof PLC (Programmable Logic Control) based control system shall be capable to prevent opening of waste charging door while the incinerator is in operation especially: a) Waste charging until the required temperature in the chambers is attained during beginning of the operation of the incinerator. b) Waste charging unless primary & secondary chambers are maintained at the specified temperature range. c) Waste charging in case of any unsafe conditions such as -very high temperature in the primary & secondary chambers; failure of the combustion air fan, ID fan, recirculation pump; low water pressure & high temperature of the flue gas at the outlet of air pollution control device.

		<ol style="list-style-type: none"> 2. Micro controlled based digital controllers in manual mode operation. 3. Fully automatic in auto mode with all safety limits and also operation in manual mode. 4. PLC: 1200/1400 with extension module. 5. Analog module: 4-20ma/0-10v. 6. Human Machine Interface: Touch Screen. 7. Isolation relays for inputs and outputs 8. SMPS: 24v/5a (or equivalent) each for relays & HMI. 9. Electrical safety: HRC Fuse, MCB 10. Should include negative draft measuring device with the primary chamber, air flow rate measuring devices with primary and secondary chambers of the Incinerator and pressure drop measuring device to the venture scrubber as per CPCB guidelines.
5.2	Data logger Control Panel	<ol style="list-style-type: none"> a) Should be with suitable box made from CRCA sheet materials, mounting plates fitting and key ignition transformer, hooter, PVC channel, control fuse, over load relay, indicating lamp, temperature controller cum indicator for primary & secondary chamber, temperature indicators etc. completely fitted, duly wired and enclosed in powder coated, dust proof sheet metal box. b) The panel shall have audio visual alarm for any abnormal operation which makes operation safe. c) Body should be made up of Sheet with Powder coated Finishing & Painting d) Should have PC system (latest Configuration with Laser Printer) and with electrical accessories, connected with PLC panel and flue gas analyzer panel (including installation of Flue Gas Analyser as per CPCB guidelines) to automatically and continuously monitor and record data of primary chamber, secondary chamber, ventury, O2gas, CO2 gas & CO gas w.r.t. to date & time. e) Should have Automatic Recording System for recording of operational parameters of Incinerator including stack gas temperature after scrubbing.
5.3	Chimney / Stack	<ol style="list-style-type: none"> 1) Height: 30.5 Meters or 100 feet from Ground Level 2) Type: Self Supporting 3) Material of Construction (MoC): Mild Steel 4) Base diameter: 1200mm in 6mmsheet (Approx.) 5) Top diameter: 400mm in 4mm sheet (Approx.) 6) The chimney should be built with Strong M.S. Base duly with rubberized lining, Inspection Window and inbuilt ladder. 7) The chimney should have Sampling port with sampling platform along with standard attachments of Aviation light, Lightning Arrestor, Stack drain and Earthing Strip. 8) The Chimney should be connected through centrifugal air blower for effective removal of emission from the entire system. 9) The Chimney should be painted externally with at least two coats of heat resistance aluminium paint. 10) The Chimney should be protected from inside by providing 3mm thick rubber lining. 11) Structural design of the chimney / stack shall be as per IS: 6533-1989.

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		<p>12) The chimney/stack shall be lined from inside with minimum of 3 mm thick natural hard rubber suitable for the duty conditions and shall also conform to IS:4682 Part I-1968 to avoid corrosion due to oxygen and acids in the flue gas.</p> <p>13) The location and specification of porthole, platform ladder reaching till the top (preferably steel scaffolding or spiral stair-case) shall be as per the Emission Regulations, Part-3 (COINDS/20/1984-85), published by CPCB. All mandatory approval, if required, for installation of the chimney shall be obtained by the successful bidder.</p>
5. Physical Characteristics		
5.1	Noise (in dBA)	Less than 60 dB
5.2	Heat dissipation	Should maintain nominal Temp inside BMW Unit s & heat should be disbursed by a cooling mechanism such as adequate cooling and exhaust fans.
5.3	Mobility, portability	Stationary Installation Type
6. Energy Source (electricity, UPS, solar, gas, water etc.)		
6.1	Power requirement	Power Input voltage-440V AC, 50Hz, 3-phase fitted with Indian plug of appropriate rating.
6.2	Protection	<p>a) Resettable over current breaker, RCB, MCB, Dipole switch, fuse</p> <p>b) Voltage corrector as applicable for the product for protection against surge current & voltage fluctuations.</p> <p>c) Should have over-charging cut-off with visual symbol.</p>
6.3	Power consumption	To be mentioned by Bidder
7. Technical Specification of Additional equipment of the package		
7.1	WEIGHING MACHINE (DIGITAL) WITH LARGE PLATFORM	<p>1) Capacity : 100 kg</p> <p>2) Should be Weight & measurement approved.</p> <p>3) Electronic weighing scales of standard make to weigh up to 100 kg. The certificate from Weights & Measures Dept. is to be attached with the machine, duly certifying the serial no. complete with accessories as per specification.</p> <p>4) Should have Stainless steel platter of high quality.</p> <p>5) Should have High brightness LED type digital display.</p> <p>6) The Bottom structure should be metal powder coated rust free.</p> <p>7) Should have advanced microprocessor based design.</p> <p>8) Battery backup: 2 hrs and above (internally or through UPS)</p> <p>9) Should have auto power cut-off.</p>
8. Details of Reagents, Accessories, Spare parts, Future Up gradation & Turnkey		
8.1	Reagent	Not required
<p>Important Note:</p> <p>a. Cost of individual Biological indicator and Waste collection bags minimally required for processing / managing 100 Kg of hospital generated wastes as mentioned above in Pt. 8.1 shall have to be quoted in Format A of Financial bid (separate PDF format other than BoQ) which shall be taken into account for financial evaluation. The prices of the same will remain valid for a period of 5 years.</p> <p>b. Non-submission of format A as well as not specifying the cost of all reagents required for performing the tests as described, shall lead to rejection of bid during financial evaluation.</p> <p>c. To be ignored if it is mentioned "Not Required".</p>		

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8.2	Standard Accessories	a) Air pressure switches-1 set b) Water pressure switch -1 set c) Thermocouples-1 set d) Water level switch-1 set e) Digital temperature controllers-1 set f) Pressure gauge-1 set g) Water level gauge-1 set h) Limit switches-1 set i) Weighing Machine-1 No. (as per the technical specification mentioned)
8.3	Future Up gradation	Not Required. (Machines of the latest technology should be provided and any future up gradations needed as mandated by any State/Central Govt. regulation/local authority/Statutory body shall be provided by the bidder Free of Cost within the warranty period)
<p>Important Note:</p> <p>a. Price break up indicating the unit cost of basic machine along with of every individual standard accessory, module and operating consumable (perishable material which is required for operation of machine) with exact required quantity as mentioned above in Pt. 8.2 shall have to be quoted as price break up in Format Boq Financial bid (separate PDF format other than BoQ) which shall be taken into account for financial evaluation.</p> <p>b. Up gradation cost shall also has to be mentioned in appropriate column of the FORMAT B if mentioned in pt. 8.3 which shall also be taken into account for financial evaluation along with unit cost of basic machine & cost of all standard accessories.</p> <p>c. Non-submission of format B as well as not specifying the cost of all items for the required quantity exactly as described shall lead to rejection of bid during financial evaluation.</p> <p>d. To be ignored where ever mentioned as "Not Required".</p>		
8.4	Spare parts	Manufacturer's Original Spare parts
<p>Important Note:</p> <p>a. This format is applicable for generally all equipment which involves repair & maintenance using spare parts.</p> <p>b. The cost of all essential spare parts, modules and maintenance consumable (perishable material which is required for maintenance of machine); which are not covered under warranty & CMC, are prone to damage frequently and are not mentioned in the technical specification; shall be mentioned in the separate price schedule FORMAT-C of the financial bid (attached as a separate PDF file) in the e-tender portal.</p> <p>c. Format C shall not be taken into account for evaluation and is only for future reference purpose but the same is also mandatory to be submitted.</p>		
8.5	Details	Installation and commissioning common to all Equipment Complete installation & commissioning are to be done by the supplier.
9. Requirements for Pre installation and Demonstration		
9.1	Requirements for Pre installation & commissioning	The bidder should inspect each site and submit the pre-installation requirement for each site (if applicable)
9.2	Demonstration	Not Required
10. Warranty and CMC details		
10.1	Warranty	FIVE (05) years onsite Comprehensive Warranty

10.2	Maintenance contract	FIVE (05) years Comprehensive Maintenance contract (CMC) after completion of onsite Comprehensive Warranty.
Environmental, Disinfection, Installation-cum-commissioning, Training or Documentary Requirements		
As mentioned in "GENERAL REQUIREMENTS COMMON FOR ALL ITEMS" of Technical Specification (Any specific requirement or deviation to the General Requirement may be mentioned below)		
Description of item/s to be supplied along with main unit		
Please mention the list of items included in the quoted model (Main Unit, Automation & data recording Modules, Accessories & Ancillaries as to be provided from OEM, AND other items to be provided by Local/ Other Manufacturer/s) with model name and Part Nos. , where ever applicable.		
Sl.	Part No.	Name of Part / Module / Consumable / Accessory /Spare part
1		Main Unit
2		Automation & data recording Modules
3	Associated part / peripheral Module etc	
a		
b		
4	Standard Accessories / Consumables / reagents / Spare parts as asked in tender(N.B: Cost of each with required quantity shall have to be quoted as price break up in the separate price schedule Format A, B (as applicable) of Financial bid in PDF format which shall be taken in to evaluation.)	
a		
b		
5	OEM's Additional Accessories / Consumables / reagents / Spare parts to be supplied along with main unit(N.B: Prices to be quoted in the separate price schedule Format-C (attached as a PDF file) which shall not be taken into account for evaluation but submission is mandatory)	
a		
b		
6	Any other Accessories other than OEM such as computer unit, printer, needle destroyer, trolley, weighing machine etc (Mention Make & Model)	
a		
b		
7	Make, Models and details of turkey work to be done actually at Site (without Price)	
a	Any Institute, Firm	