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| CLIENT: | JOB No |
| PROJECT NAME : KRHT-200 (200kg/hr Medical Waste Incinerators) | DOC No |
| | PAGE : |

MODEL : KRHT-200

**PROPOSAL
of
200KG/HR MEDICAL WASTE
INCINERATION PLANT**

November. 2019

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| REV. | DATE | DESCRIPTION | PREP'D | CHK'D | APP'D |

KOREA INCINERATOR CO.,LTD

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|-------------------------------------|-------------------------------|-----------|
| CLIENT: | Estimate Specification | JOB № : |
| PROJECT NAME : | | DOC № : |
| 200kg/Hr Medical Waste Incinerators | | PAGE : OF |

- TABLE OF CONTENTS -

1. General
2. Design Condition
3. Incineration Equipment
4. Drawings

| | | |
|-------------------------------------|-------------------------------|-----------|
| CLIENT: | Estimate Specification | JOB № : |
| PROJECT NAME : | | DOC № : |
| 200kg/Hr Medical Waste Incinerators | | PAGE : OF |

1. GENERAL

1.1 Outline

This facility is based on incinerator which incinerate medical wastes and prevention facilities which treat fly ash from incinerator and other service facilities.

1.2 Site

Appointed location in

1.3 Scope of estimate

- Offered scopes included

- 1) Supply of incinerator & accessories
- 2) Ocean transportation fee
- 3) Installation & commissioning fee.

1.4 Delivery Period

80days after contract

1.5 200kg/hr Incinerator of medical waste

1.6 Completion and guarantee

- 1) Completion : Completion date is delivery time completion date.
- 2) The term of guarantee : We guarantee performance and extra defects for 1 yearafter delivery time completion.
- 3) Defect-management : If defects occurred in the term of guarantee, contractor should fix on contractor's responsibility.

| | | |
|-------------------------------------|-------------------------------|-----------|
| CLIENT: | Estimate Specification | JOB № : |
| PROJECT NAME : | | DOC № : |
| 200kg/Hr Medical Waste Incinerators | | PAGE : OF |

1.7 Design Standard

1) Target waste composition ratio

| Division Name of waste | Amount of waste (kg/hr) | Ratio (%) | Remark |
|---|--------------------------------|------------------|---------------|
| Human anatomical waste | 20 | 10 | |
| Microbiological infectious waste | 70 | 35 | |
| Non-anatomical infectious waste | 40 | 20 | |
| General hospital waste | 70 | 35 | |
| Total | 200 | 100 | |

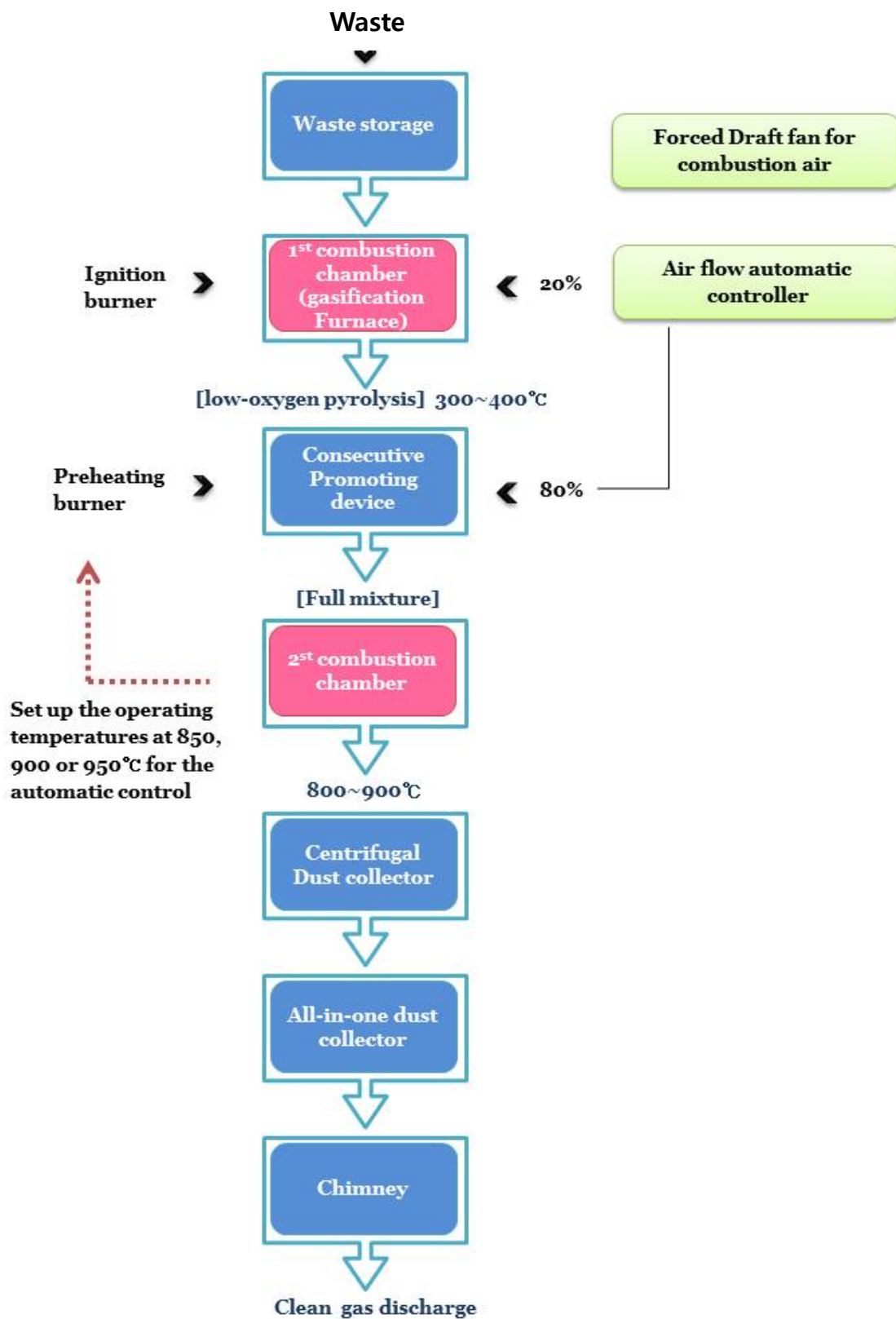
2) Permitted emission standards and exhaust gas design standards

(Facility standards: Less than 200kg/hr of incineration capacity)

| Pollutants | Permitted emission standards | Design standards (CYCLONE TYPE / No Smoke & No Odor) |
|-------------------|---|---|
| | KOREA | |
| CO | Less than 200(12)ppm | Less than 100(12) ppm |
| NOx | Less than 100(12)ppm | Less than 100(12) ppm |
| Dust | Less than 70(12)mg/Sm ³ | Less than 70(12) mg/Sm ³ |
| Exhaust fumes | Less than 2 degree Ringelmann Smoke Chart | Less than 1 degree Ringelmann Smoke Chart |
| Ignition loss | 10% | 5% |

| | | |
|-------------------------------------|-------------------------------|-----------|
| CLIENT: | Estimate Specification | JOB № : |
| PROJECT NAME : | | DOC № : |
| 200kg/Hr Medical Waste Incinerators | | PAGE : OF |

3) Treatment flowchart



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|-------------------------------------|-------------------------------|-----------|
| CLIENT: | Estimate Specification | JOB № : |
| PROJECT NAME : | | DOC № : |
| 200kg/Hr Medical Waste Incinerators | | PAGE : OF |

2. DESIGNING CONDITION

2.1 Waste incineration condition

- (1) Type of waste: medical waste
- (2) A low degree caloric value: 4,000 ~ 5,000 kcal/kg
- (3) Burn rate: 200 kg/Hr
- (4) Operation condition: 2 ~ 24 Hr/Day

2.2 Utility

Utility condition for incineration equipment operating is as following:

- (1) Fuel : Light oil or kerosene
- (2) Electricity
 - Motor:
 - ① 0.1 ~ 110kW : AC 220V x 3PH x 50Hz
 - ② Below 0.1kW: AC 220V x 1PH x 50Hz
 - Control circuit :
 - ① MCC control : AC 220V x 1PH x 50Hz
 - ② Instrument: AC 220V x 1PH x 50Hz
 - ③ Switch gear : AC 220V x 1PH x 50Hz

| | | |
|-------------------------------------|-------------------------------|-----------|
| CLIENT: | Estimate Specification | JOB № : |
| PROJECT NAME : | | DOC № : |
| 200kg/Hr Medical Waste Incinerators | | PAGE : OF |

3. INCINERATION EQUIPMENT

3.1 Incineration equipment outline

- Features

- Batch Feeding method (One batch: 400 kg)
- Pyrolysis gasification combustion
- Smokeless& odorless perfect combustion
- Automatic control function
- Economically excellent equipment with minimum fuel consumption
- Highly safe equipment as excellently insulated from external heat input
- Minimization of installation space

3.1.1. Gasification furnace (Primary combustion chamber)

- 1) Type: Batch feeding dry distillation type
- 2) Quantity: 2 SET
- 3) Burn rate: 190~210kg/Hr
- 4) Size: $\phi 1,872 \times 1,955$ mmH
- 5) Furnace volume: 3.14m³
- 6) Material: External- Steel Plate 6t, Channel
Internal- Fireproof castable CT-160
Ceramic Fiber
- 7) Accessories: Sight glass, thermocouple

3.1.2. Ignition combustion device

- 1) Type: Air mixing type
- 2) Quantity : 1 SET
- 3) Dimension: 712mm ϕ x 1,335mmL
- 4) Material : Steel Plate 6t x Castable insulated with fireproof material
- 5) Accessory: thermocouple

| | | |
|-------------------------------------|-------------------------------|-----------|
| CLIENT: | Estimate Specification | JOB № : |
| PROJECT NAME : | | DOC № : |
| 200kg/Hr Medical Waste Incinerators | | PAGE : OF |

3.1. Combustion furnace (Secondary combustion chamber)

- 1) Type: Uptrend combustion type
- 2) Quantity: 1 SET
- 3) Size: $\varnothing 1,407 \times 3,412$ mmH
- 4) Furnace volume: 2.828m³
- 5) Material: External - Steel Plate and Channel
Internal - Fireproof castable, Ceramic board 50t
Others - Burner tile, Fireproof castable
- 6) Accessory: thermocouple

3.1.4 Ignition burner

- 1) Model: 1 STAGE burner
- 2) Quantity: 1 SET
- 3) Capacity: 4~9.7 kg/Hr(LT-10)
- 4) Fuel: Light oil or kerosene
- 5) Motor: 0.15kW x 220V x 50Hz
- 6) System: Electric automatic ignition system
- 7) Accessories: Flame detector, Fuel shut-off device

3.1.5 Auxiliary Burner

- 1) Model : 2 STAGE burner
- 2) Quantity : 1 SET
- 3) Capacity: 12~30 kg/Hr(LT-30U)
- 4) Fuel : Light oil or kerosene
- 5) Ignition Method: Electric automatic ignition system
- 6) Motor : 0.4kW x 220V x 50Hz

| | | |
|-------------------------------------|-------------------------------|-----------|
| CLIENT: | Estimate Specification | JOB № : |
| PROJECT NAME : | | DOC № : |
| 200kg/Hr Medical Waste Incinerators | | PAGE : OF |

3.1.6 Oil tank

- 1) Type:Cylindrical Type
- 2) Quantity :1 SET
- 3) Capacity :450ℓ
- 4) Dimension:780 mmØ x 1,228mmL
- 5) Material : SS400
- 6) Fuel : Light oil or kerosene
- 7) Accessories: Level gauge

3.1.7 Oil piping

- 1) Oil supply pipe
 - Oil tank → Auxiliary burner
 - Oil tank → Ignition burner

3.1.8 Dust collection device

- 1) Type:Centrifugal force CYCLONE
- 2) Size: Φ1,405X 4,800mmH
- 3) Material: Castable CT-160 + Steel plate

3.1.9 FORCED DRAFT FAN

- 1) Type :Turbo Fan
- 2) Material:SS400
- 3) Quantity:1 SET
- 4) Capacity :106m³/min x 350mmAq, 50Hz
- 5) Power :15 kW

| | | |
|-------------------------------------|-------------------------------|-----------|
| CLIENT: | Estimate Specification | JOB № : |
| PROJECT NAME : | | DOC № : |
| 200kg/Hr Medical Waste Incinerators | | PAGE : OF |

6) Component

① Damper

- Material :SS400, FC
- Quantity:1 SET
- Type : Swing type

② Canvas

- Material :Cloth
- Quantity:1 SET

3.1.10 Ejector fan

1) Type :Turbo Fan

2) Material:SS400

3) Quantity:1 SET

4) Capacity :35m³/min x 200mmAq, 50Hz

5) Power :15 kW

6) Component

① Damper

- Material :SS400, FC
- Quantity:1 SET
- Type :SWING TYPE

② Canvas

- Material :Cloth
- Quantity:1 SET

| | | |
|-------------------------------------|-------------------------------|-----------|
| CLIENT: | Estimate Specification | JOB № : |
| PROJECT NAME : | | DOC № : |
| 200kg/Hr Medical Waste Incinerators | | PAGE : OF |

3.2 Chimney

- 1) Type : Vertical type
- 2) Material :SS400
- 3) Quantity:1 SET
- 4) Volume : 635mmΦ x 3,000mmH

3.3 Central control

- 1) Type:Cabinet type(Outdoor type)
- 2) Size:500W × 300D × 700H
- 3) Material:Steel Plate 1.5t
- 4) Quantity:1set
- 5) Built-in device
 - A) Various indicating instruments:Internal temperature of furnace,
Re-combustion temperature
 - B) LAMP indication:Exhaust gas temperature of each combustion furnace
- 6) Special features

In order to achieve perfect combustion under optimum combustion conditions, it controls the operation of the incinerator automatically or, if necessary, manually.

- 7) Equipments :Push button, Color lamps
N.F.B, M/G, S/W etc.
Automatic temperature control device
- 8) Inter lock
 - F.D FAN Power Cut-off
 - Auxiliary burner automatic cut-off
- 9) Cable
 - Electric power facilities: CV Cable
 - Instrumentation facilities: CVV Cable
 - Connecting cable inside the panel: IV cable
- 10) Scope of wiring work
 - CONTROL PANEL ↔ Each device and motor

| | | |
|-------------------------------------|-------------------------------|-----------|
| CLIENT: | Estimate Specification | JOB № : |
| PROJECT NAME : | | DOC № : |
| 200kg/Hr Medical Waste Incinerators | | PAGE : OF |

11) Thermocouple

- Name:thermocouple(Φ20 × 300L) K-Type
- Range: 0 ~ 1,200℃
- Quantity:3pieces

12) Function:

- Power: ON - OFF
- F.D fan: ON - OFF
- Ejector fan: ON - OFF
- Ignition burner: ON - OFF
- Auxiliary burner: ON - OFF
- Temperature indicator

3.4. Piping and wiring work

Each drive motor → Panel board

Primary & secondary burner → Oil feeding tank

3.5. Others

- A. Incinerator plant lay-out drawing : attached
- B. Spare part :main part each 1set(burner, packing, thermocouple etc)

| | | |
|-------------------------------------|-------------------------------|-----------|
| CLIENT: | Estimate Specification | JOB № : |
| PROJECT NAME : | | DOC № : |
| 200kg/Hr Medical Waste Incinerators | | PAGE : OF |

4. DRAWING

- 1) ASS'Y.DWG