DUTCH INCINERATORS
Engineered for a cleaner tomorrow

DI1.5M
(SKID MOUNTED/MOVABLE UNIT)
DATASHEET

No.	Topic	General	Description
1	Brand	Dutch Incinerators BV, The Netherlands (DI-NL)	Expert in design, construction, installation and commissioning of thermal treatment systems for hazardous/chemical/ toxic/clinical/infectious waste streams
2	Supply	EPC Contractor	Turnkey package completely tested before shipment Local installation, commissioning, operator training and operating manual
3	Technology	High Temperature Thermal Treatment	Counter-current rotary kiln incineration
4	Reliability	Most versatile technology in thermal treatment of hazardous waste	Wide operational window on physical, chemical & thermal input Clogging-free design - Minor slag agglomeration - No unscheduled shutdowns
5	Availability	Minimum annual plant uptime = 90% Minimum 7,884 hours/year (328 days/annum)	Cold start-up phases limited to 6 times per year 1 or 2 pre-scheduled general maintenance shutdowns per year
6	Safety	Preventive hygienic measures and safety precautions to personnel, surrounding, inhabitants and the environment	Automated safety interlocks and plant shutdown Special attention to fire and explosion safety
7	Standards	Compliance with European Incineration and Emission Directive	European Industrial Emission Directive 2010/75/EU (IED)
8	Thermal Input Capacity	1.5MW	1,500 kW on Higher Calorific Value (HCV) waste basis
9	Model	DI1.5M-DFGT (standard design) DI1.5M-WFGT (standard design)	Option DFGT: Dry Flue Gas Treatment (dry scrubber) Option WFGT: Wet Flue Gas Treatment (wet scrubber)
10	Layout	Skid mounted/movable construction	Installed on ISO standard 40ft flat rack container frames (12.2m x 2.44m x 2.6m) Movable with a trailer truck and on site anchored on a concrete slab
11	Process flow	Full continuous 24/7 operation, at variable rotational speed	Fully automated plant operation, PLC controlled
12	Online access	Remote access via internet, from anywhere on the planet	Optional
13	Combustion process	Self-supporting thermal chain combustion reaction	Free from auxiliary burner fuel after cold plant start-up (5 hours)
14	Throughput capacity	Directly related to the waste's Higher Calorific Value (HCV)	F.i.: HCV = 21,600 kJ/kg = 250 kg/hr = 6 ton/day F.i.: HCV = 14,400 kJ/kg = 375 kg/hr = 9 ton/day
15	Feeding system	Fully automated bin lifting (skip hoist) feeding system	Design options for solids, liquids, semi-liquids, pastes, sludges, emulsions, etc. Optional: Feeding hopper for automated solid waste feeding / Liquid waste feeding system
16	Data Acquisition and Storage (DAQ)	Automatic weight/throughput measuring and recording system	Optional: Data logging and visual data representation to identify patterns and trends
17	Combustion chambers	Primary (rotary) combustion chamber Secondary (post) combustion chamber	Maximum primary combustion efficiency, no waste solidification at the kiln bottom Post combustion to complete gas phase combustion reactions
18	Refractory	First rate castable refractory installed in primary and post combustion chambers	High temperature proof 10 years lifetime when maintained according to contractor's instructions
19	Temperature/residence time	Primary combustion: ≥ 1,000°C Post combustion: ≥ 850°C up to 1,100°C	Primary combustion: 30 to 90 minutes residence time Post combustion: ≥ 2 seconds residence time (or higher, upon local requirements)
20	Burner	Back-up electric ignition burner installed at primary combustion chamber Back-up electric ignition burner installed at post combustion chamber	Utilised only when waste HCV is not adequate for burning (<12MJ/kg) To warrant compulsory minimum flue gas temperature under all circumstances
21	Burner fuel	Diesel, LPG or natural gas	Solely used during each cold start-up. Burner is switched off after start-up phase (5 hours) No auxiliary burner fuel required during the continued combustion process when waste HCV is >12MJ/kg
22	Ash discharge	Continuous fully automated ash discharge system	Kiln bottom ash and fly ash collection via replaceable sealed ash bins No shutdown for ash removal
23	Emergency relief stack	Installed on top of the post combustion chamber	Automatic release of combustion gases in the post combustion chamber in case of over-pressurization in the primary combustion chamber or at a power cut situation
24	SNCR	SNCR urea injection system	Optional: Reducing NOx emissions from the flue gasses with 25% to 40%
25	Energy recovery	Combined heat & power (CHP)	Optional: Hot air, hot water, chilled water, electricity
26	Flue gas treatment	Option DFGT: Dry Flue Gas Treatment system Option WFGT: Wet Flue Gas Treatment system	Option DFGT: Emission Limit Value for Particulate Matter (dust) is ≤ 10 mg/Nm3 Option WFGT: Emission Limit Value for Particulate Matter (dust) is ≤ 50 mg/Nm3
27	Scrubber additives	Option DFGT: Sodium bicarbonate, Activated Carbon Option WFGT: Caustic soda	Consumption rates depend upon waste contaminant concentrations
28	Emission standard	European Industrial Emission Directive 2010/75/EU (IED) In compliance with local directives and regulations	Emission data are displayed on the main computer and recorded at regular intervals via CEMS
29	CEMS	Continuous Emission Monitoring/Measuring System	Standard FTIR based CEMS analyzer: CO, CO2, HCl, HF, NOx, NH3, O2, SO2, TOC, H2O, PM Other parameters can be added, upon Purchaser's request
30	Data Acquisition System (DAS)	Automatic storage and notifying of analysed emission data	Optional: Direct (automatic) reporting of emission results to authorities and external parties
31	Flue stack	Release of cleansed flue gases to the atmosphere	Option DFGT: No visible vapour plume Option WFGT: Visible water vapour plume
32	Plume suppression	Wet stack, water vapour plume suppression	Optional: Flue gas reheating at the stack
33	Waste water treatment	Wet scrubber waste water	Optional: Removal of heavy metals from the scrubber waste water, no disolved solids removal
34	Maintenance	General housekeeping General maintenance shutdown	Daily and weekly routine inspection and systematic upkeep by the operator Pre-scheduled general maintenance service - completed in 8-10 consecutive days
35	Indoor - Outdoor	Engineered and constructed for outdoor application	Bag filter house and dry scrubber additive dosing system must be protected from moisture A complete incinerator shed or building can be installed for operator convenience
36	Conformity	CE / UKCA / EPA / WHO	DI-NL ensures conformity with all relevant country-wide technical requirements and full compliance with applicable standards and legislation
37	Utilisation	Designed for: hazardous, chemical, toxic, (bio)medical and infectious wastes Non-hazardous and non-recyclable wastes	Emergency response, testing specific waste streams, application in remote areas, temporary waste treatment projects, etc.

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TECHNICAL SPECIFICATIONS

No.	Topic	Dry Flue Gas Treatment (DFGT)	Wet Flue Gas Treatment (WFGT)	Addition
1	Thermal input capacity	1.5 MW	1.5 MW	Nominal design capacity, HCV basis
2	Model	DI1.5M - DFGT	DI1.5M - WFGT	Option DFGT: Dry scrubbing Option WFGT: Wet scrubbing
3	Electricity consumption	49 kW	49 kW	Nominal electricity requirement
4	Total installed motor power	63 kW	63 kW	Alternating current (AC): 50 Hz
5	Burner fuel consumption	650 kg diesel (per each cold start-up)	650 kg diesel (per each cold start-up)	Auxiliary burner fuel necessitated during each cold start-up only Approximately 5 hours x 130 kg/hour (= 155 liters/hour)
6	Process water consumption	0.85 m3/hour	1.4 m3/hour (nominal) 2.3 m3/hour (maximum)	Option DFGT: Flue gas cooling water Option WFGT: Flue gas cooling water + Wet scrubbing water
7	Wastewater discharge	0 m3/hour	0.75 m3/hour	WFGT discharge between 0.00 m3/hr to 0.75 m3/hr 0.75 m3/hr is based on 5m% Cl and 2 m% S in the waste feed
8	Additives	Sodium-bicarbonate Activated carbon Urea (optional)	Caustic soda Urea (optional)	Additive consumption is based on grade of waste contamination Optional: Urea (SNCR) to reduce NOx concentration after the post combustion chamber by 25-40% for both systems
9	Plant dimensions (LxW)	240 m2 (20 m x 12 m) 3 ISO standard 40ft flat rack container frame units	130 m2 (20m x 6.5m) 2 ISO standard 40ft flat rack container frame units	Nominal dimensions
10	Plant height	2.5 meter	2.5 meter	Within container dimension
11	Flue stack height	5.5 meter	5.5 meter	Nominal height
12	Emergency stack height	2.5 meter	2.5 meter	Within container dimension
13	Building dimension	450 m2 (25 m x 18 m)	300 m2 (25m x 12m)	Nominal dimensions
14	Building roof height	4 meter	4 meter	Nominal height
15	Total weight	70 MT (= 70,000 kg)	55 MT (= 55,000 kg)	Nominal weight
16	Manpower	1 Supervisor operator 1 Waste supply operator	1 Supervisor operator 1 Waste supply operator	Per 8-hours or 12-hours shift
17	Cold start-up	4 - 6 per annum	4 - 6 per annum	
18	Maintenance shutdowns	1 - 2 per annum	1 - 2 per annum	General overall maintenance service
19	Energy Recovery Efficiency (LCV)	50 - 70 % 1050 kWth	50 - 70 % 1050 kWth	Average thermal energy recovery efficiency, on LCV basis Maximum gross thermal output
20	Electricity generation (via ORC)	59 kWe	59 kWe	Electricity output Organic Rankine Cycle (ORC)
21	Wastewater treatment	Not required	Optional	

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