DUTCH INCINERATORS
Engineered for a cleaner tomorrow

DI12-DFGT
(STATIONARY EMBEDDED UNIT)
DATASHEET

No.	Topic	General	Description
1	Brand	Dutch Incinerators BV, The Netherlands (DI-NL)	Renowned for more than 35 years competence and expert knowledge in high temperature thermal treatment systems for heterogeneous hazardous, chemical, toxic, clinical and infectious waste streams
2	Supply	EPC Contractor	Turnkey supply Engineering, procurement, manufacturing, installation, commissioning, operator training, start-up
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 guaranteed annual plant uptime = 91.3% (Typical 95%-97%) Minimum 8,000 hours/year (333 days/annum)	Cold start-up phases limited to 1-2 times per year 1 pre-scheduled general maintenance shutdown 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 Best Available Technique Conclusions (BATC)	European Industrial Emission Directive 2010/75/EU (IED) - Integrated Pollution Prevention and Control BATC - Reference Document for Waste Incineration, EU Directive December 2019
8	Thermal Input Capacity	12MW	12,000 kW on Higher Calorific Value (HCV) waste basis
9	Model	DI12-DFGT (standard design)	DFGT: Dry Flue Gas Treatment (dry scrubber) Option WFGT: Wet Flue Gas Treatment (wet scrubber)
10	Layout	Stationary embedded unit	Installed on a steel-reinforced concrete slab Anchor points keep the installation in place
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 Burner fuel is restricted to 5 hours/year, when the waste has a minimum calorific value of >12MJ/kg
14	Throughput capacity	Directly related to the waste's Higher Calorific Value (HCV)	F.i.: HCV = 21,600 kJ/kg = 2000 kg/hr = 48 ton/day F.i.: HCV = 14,400 kJ/kg = 3000 kg/hr = 72 ton/day
15	Feeding system	Fully automated bin lifting (skip hoist) feeding system	Design options for solids, liquids, semi-liquids, pastes, sludges, slurries, emulsions, etc. Optional: Feeding hopper for automated solid waste feeding / Liquid waste feeding system
16	Data Acquisition and Storage (DAQ)	Automatic weight and throughput measuring and recording system	Data logging hardware will connect and interface to a computer or server for subsequent data storage Visual representation of the data collected to identify patterns and trends in the data
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 of approximately 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	Automatic kiln bottom ash and fly ash collection via replaceable sealed ash bins No intervention, break or shutdown for ash removal
23	Emergency relief stack	Installed on top of the post combustion chamber	Automatic release of combustion gasses 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, reducing NOx emissions	Optional: Dependent on local standards and regulations
25	Energy recovery (ER)	Combined heat & power (CHP) Hot air, hot water, chilled water and/or electricity (no steam)	Optional: ER selection in accordance with Purchaser's requirements
26	Flue gas treatment	Standard: Dry Flue Gas Treatment system (DFGT)	Option DFGT+ WFGT: Combination of a dry (DFGT) and wet (WFGT) scrubber
27	Scrubber additives	Option DFGT: Sodium bicarbonate and activated carbon Option WFGT: Sodium hydroxide (caustic - NaOH)	Additive consumption rates depend upon waste contaminant concentrations
28	Emission standard	European Industrial Emission Directive 2010/75/EU (IED) & BATC In compliance with local standards, directives and regulations	Emission data are displayed on the main computer and recorded at regular intervals via a 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	Direct (automatic) reporting of emission results to authorities and external parties
31	Flue stack	Release of cleansed flue gasses 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: Through mixing hot air from the energy recovery section with colder flue gasses from wet scrubber
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 daily housekeeping General annual maintenance shutdown	Daily and weekly routine inspection and systematic upkeep by the operator Pre-scheduled overall maintenance service, executed in 10-12 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 Obviously qualified for non-hazardous and non-recyclable waste streams	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)		Addition
1	Thermal input capacity		12	MW	Nominal design capacity, HCV basis
2	Operational thermal input deviation		20	%	Input within a range of 9.6MW up to 14.4MW
3	Model		DI12 -	DFGT	Standard: Dry scrubbing (DFGT) Option: DFGT+ WFGT: Combination of a dry (DFGT) and wet (WFGT) scrubber
4	Electricity consumption		213	kW	Nominal electricity requirement - adjusted after concept-/basic design
5	Total installed motor power		379	kW	50Hz or 60Hz - 3 phase
6	Burner fuel consumption		1500	kg diesel (per each cold start-up)	Auxiliary burner fuel necessitated during each cold start-up only Approximately 5 hours*300 kg/hour = 1500kg (= 1786 liters)
7	Process water consumption		4.8 - 12	m3/hour	Nominal process water requirement - adjusted after concept-/basic design Flue gas cooling water (DFGT + WFGT) + wet scrubbing water (WFGT)
8	Waste water discharge		0	m3/hour	WFGT waste water discharge depends on grade of waste contamination
9	Additives/reagents			Sodium-bicarbonate + Activated carbon (DFGT) Sodium hydroxide - 30 mass% solution (WFGT) Urea - 100% pure (optional)	Actual additive consumption is based on the grade of waste contamination Reducing NOx emissions from the flue gasses with 25% to 40%
10	Plant dimensions	Length Width	60 40	meter meter	Nominal dimensions - adjusted after concept-/basic design
11	Plant area	L*W	2400	square meter (m2)	Nominal dimension We can design the incineration plant within available surface
12	Flue stack	Height	30	meter	Nominal height - adjusted after concept-/basic design
13	Emergency stack	Height	28	meter	Nominal height - adjusted after concept-/basic design
14	Building dimensions	Length Width	70 50	meter meter	Nominal dimensions - adjusted after concept-/basic design
15	Building area	L*W	3500	square meter (m2)	Nominal dimension We can design the plant within an existing building, under defined conditions
16	Building roof	Height	26	meter	Nominal height - adjusted after concept-/basic design
17	Total weight		395	tonnnes	Nominal weight - adjusted after concept-/basic design
18	Manpower		1 1	Supervisor operator Waste supply operator	Per 8-hours or 12-hours shift
19	Cold start-up		1 - 2	per annum	
20	Maintenance shutdowns		1	per annum	General annual maintenance service
21	Energy Recovery Efficiency (LCV)		60 - 80 9600	% kWth	Average thermal energy recovery efficiency, on LCV basis Maximum gross thermal output
22	Steam boiler		13800 215 20	kg/hr °C bar(g)	Saturated steam generation - water tube type
23	Turbine generator		900	kWe	Electricity output
24	Waste water treatment			Not required	DFGT model has zero waste water generation