EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate No:
MEDB00008BG

Application of: Directive 2014/90/EU of 23 July 2014 on marine equipment (MED), issued as "Forskrift om Skipsutstyr" by the Norwegian Maritime Authority. This Certificate is issued by DNV AS under the authority of the Government of Norway.

This is to certify:

That the Shipboard incinerators (Incinerator plants with capacities up to 4 000 kW)

with type designation(s)
Atlas X910 S, S WS, SL, SL WS types

Issued to
Atlas Incinerators ApS
Vordingborg, Sjælland, **Denmark**

is found to comply with the requirements in the following Regulations/Standards:
Regulation **(EU) 2022/1157,**
item No. MED/2.7. Marpol 73/78 as amended, Annex VI Regulation 16, IMO Res. MEPC.244(66)

Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2028-01-05**.

Issued at **Høvik** on **2023-01-06**

DNV local unit:
Denmark CMC

Approval Engineer:
Wenjun Wu

Notified Body
No.: **0575**

for **DNV AS**

Sverre Olav Bergli
Head of Notified Body

The mark of conformity may only be affixed to the above type approved equipment and a Manufacturer's Declaration of Conformity issued when the production-surveillance module (D, E or F) of Annex B of the MED is fully complied with and controlled by a written inspection agreement with a Notified Body. The product liability rests with the manufacturer or his representative in accordance with Directive 2014/90/EU.
This certificate is valid for equipment, which is conform to the approved type. The manufacturer shall inform DNV AS of any changes to the approved equipment. This certificate remains valid unless suspended, withdrawn, recalled or cancelled.
Should the specified regulations or standards be amended during the validity of this certificate, the product is to be re-approved before being placed on board a vessel to which the amended regulations or standards apply.

Product description

The X910 is a marine incinerator consisting of three combustion chambers with one multi-burner for preheating, support burning and incineration of sludge oil. The incinerator may be configured for batch loading or continuous feeding of solid waste. X910 incinerator is of same basic design as X610 series but has larger capacity. The X910 S WS and SL WS types are equipped with a waste sluice, while S and SL types are not.

Waste is delivered to the primary combustion chamber which is lined with refractory material. Most of the incineration takes place in this chamber with assistance from multi-burner (as needed). The secondary chamber is lined with refractory material and is arranged to ensure any remaining unburned particles, droplets or gases are incinerated. The remaining gas is directed to a tertiary steel chamber with air cooled exterior prior to leaving the incinerator through the flue duct.

The whole incinerator is double shelled and cooling air is continuously flowing between the walls to keep the outside temperature as low as possible. The cooling air is led to the outer part of the incinerator, where it drags the combustion gas out of the incinerator thereby securing an under pressure in the combustion chambers.

Ash is removed from the incinerator manually through the ash door.

Application/Limitation

Application

The incinerator model X910 may be used to burn Solid Wastes or Waste Oil (sludge). The rated capacities of X910 incinerator are listed below:

Max. Capacity	1097 kW
Waste Oil (models with sludge burner)	125 l/hr 31538 kJ/kg
Solid Waste (continuous feed models)	125 kg/h IMO Class 2 12000 kJ/kg
Solid Waste (batch models)	50 kg/batch IMO Class 2 12,000 kJ/kg

Limitations

A new PLC module X20DS438A is added for reading signals from the new water content sensor LMC110. This PLC module is undergoing type approval process to verify its suitability for marine application, and the type approval certificate shall be provided to DNV when it is in place. This limitation will be removed then, and the certificate re-issued after receipt of the type approval certificate.

Basis of acceptance

Electrical and control components

The units are controlled through automation systems type tested and accepted by a nationally recognized testing agency, according to international standards. Critical components are listed in the table below:

Component Name and Model	Maker

Component Name and Model	Maker

Changes to these components shall be approved by DNV in advance. Documentation confirming the approval shall be kept together with the certificate, or the certificate shall be updated.

The software and firmware editions are listed in the table below:

Component	Software/Firmware Edition	Date
PLC Program	“Atlas_Incinerators_X10”, Edition “2022.11.23”	23-11-2022
I/O Board Firmware	Rev. 104.0	06-12-2021

Changes to the software are to be recorded, the records of all changes are to be forwarded to DNV for evaluation. Major changes in the software, which can alter the performance of the system, require approval in advance. Testing of the application functions of the revised software may be required.

In addition, there will be a configuration file which is different for each project. This file contains non-essential parameters and so it is not included in the table above.

Type examination documentation

Drawings and system documents

Assembly Drawings

Drawing Title	Drawing Number	Revision
TITAN X910 S Dimension and component drawing	910103	0 (23-02-2022)
TITAN X910 S WS Dimension and component drawing	910102	0 (25-02-2022)
TITAN X910 SL Dimension and component drawing	910101	0 (11-01-2022)
TITAN X910 SL WS Dimension and component drawing	910100	0 (25-02-2022)

Piping Diagrams

Drawing Title	Drawing Number	Revision
PID for: TITAN X610/X910 S + Diesel Oil Tank (DOT) + Diesel Oil Pump Rack	26I50104	0 (20-10-2021)
PID for: TITAN X610/X910 S WS + Diesel Oil Tank (DOT) + Diesel Oil Pump Rack	26I50103	0 (19-10-2021)
PID for: TITAN X610/X910 SL + Sludge Oil Tank (SOT) + Diesel Oil Tank (DOT) + Diesel Oil Pump Rack	26I50102	0 (19-10-2021)
PID for: TITAN X610/X910 SL WS + Sludge Oil Tank (SOT) + Diesel Oil Pump Rack	26I50100	1 (13-10-2021)

Mechanical Drawings and Data Sheets

Drawing Title	Drawing Number	Revision
Wall construction for model X incinerator	260300	0 (14-10-2019)
Data sheets for refractory and insulation material (Isofrax 1260°C boards and Alocast H60)	-	0 (14-10-2019)
"System Datasheet, Air Blower Centrifugal Type. X610: 380 V - 415 V, 50 Hz, 440 V - 480 V 60 Hz. X910: 380 V - 415 V, 50 Hz, 440 V - 480 V, 60 Hz. "	AB01	2 (28-04-2022)
System Datasheet, Pneumatic Double Acting ISO Cylinder – for Sluice	AC01	1 (04-11-2022)
System Datasheet, Air Distribution Block, for Pneumatic Solenoid Valves SV02	AD01	0 (11-11-2019)
System Datasheet, Door Locking Guard for X10 Series Sluice and Ash Door, Safe Locking	DL01	1 (04-11-2021)
System Datasheet, Photo Resistive Flame Detector for Combustion Chamber Flame Detection	FD01	0 (25-11-2019)

Drawing Title	Drawing Number	Revision
Fuel Pump/Pilot Pump, Main Burner, Fuel Adding Pump & Pilot Burner Fuel Supply Pump	FP01/PP01	1 (04-11-2021)
System Datasheet, Ignition Electrodes, for Burner Ignition	IG01	0 (25-11-2019)
System Datasheet, Reed Switch, Feedback for Cylinder Position	IS01	0 (11-11-2019)
System Datasheet, Air Motor Valve, X10 Multiburner, Damper Adjustment For Combustion Air	MV01	1 (04-11-2021)
System Datasheet, Pilot Fuel, Oil Nozzle	ON01	2 (29-04-2022)
System Datasheet, Water Transmitter LMC110, used to measure water content in sludge oil	WT01	1 (14-02-2022)
System Datasheet, Oil Valve, Pneumatic Angled (POV) for Sludge Oil Line	OV01	1 (04-11-2021)
System Datasheet, Pressure Regulator, Regulation for Atomizing Air	PR01	0 (11-11-2019)
System Datasheet, Pressure Switch for X10 Series Pressure Verification	PS01	0 (25-11-2019)
System Datasheet, Pressure Transmitter, for X10 Series Combustion Chamber Pressure Detection	PT01	0 (25-11-2019)
System Datasheet, Pressure Transmitter, for Fuel and Sludge Oil Lines	PT02	0 (25-11-2019)
System Datasheet, Pressure Relief Valve, Check Relief / Overflow Valve for Sludge Dosing Line	RV01	1 (04-11-2021)
System Datasheet, Main Burner Nozzle, For X10 Series Multiburner	SN01	1 (04-11-2021)
System Datasheet, Sludge Dosing Pump, Displacement Pump, Excentric Type	SP01	1 (04-11-2021)
System Datasheet, Solenoid Valve for Diesel and Air Supply Lines	SV01	0 (27-11-2019)
System Datasheet, Solenoid Valve for Pneumatic Actuators & Valves	SV02	0 (27-11-2019)
System Datasheet, Solenoid Valve for Pneumatic Actuators & Valves	SV03	0 (27-11-2019)
System Datasheet, Thermocouple for Combustion Chamber	TT01	0 (11-11-2019)
System Datasheet, Thermocouple for Flue Gas Measurement	TT02	0 (11-11-2019)

Electrical and Instrumentation Drawings

Drawing Title	Drawing Number	Revision
Incinerator X910_R1 (56 pages)	-	1 (21-04-2022)

Miscellaneous Drawings

Drawing Title	Drawing Number	Revision
Warning sign for incinerator X	280071	0 (01-03-2022)
Warning sign for waste sluice	280037	0 (11-09-2012)
Warning sign for ash door	280069	0 (14-10-2019)
Signs for feeding door position	280072	0 (14-10-2019)
Sign for atomizing air pressure	280036	0 (11-09-2012)
Type sign for incinerator X	280070	2 (29-04-2022)

Operation, Installation and Maintenance Manual

Drawing Title	Drawing Number	Revision
Complete manual for Atlas Incinerator X910, Installation, Operation, Maintenance, Spare parts	-	0

Test plans and reports

- Testing plan for incinerator X910, rev. 2, 25.10.2022
- Atlas Incinerators ApS X910 test report and appendices, rev. 2, 30.12.2022

Tests carried out

Capacity and emissions test:

- Capacity and emissions test of Atlas X910, 26-27.11.2022

Safety and control tests:

- Safety and control tests with Atlas X910 incinerator, 05.04.2022 and 01.11.2022, witnessed by DNV

Marking of product

The marking shall give the following information:

- Manufacturer's name or trademark
- Type designation
- Serial number
- Capacity (net design heat release)
- Revision information, as applicable, for all firmware or software modules.

Revision history

Rev.	Date of issuance	Description
-	2023-01-06	

A copy of this certificate should be carried on board any ship equipped with the system described above.

APPENDIX

Capacity and emission test data

Incinerator manufactured by:

Incinerator type and model:

Place and date of test:

Max. Capacity:	
Waste Oil:	
Solid Waste:	
Pilot Fuel Consumption (Solid Waste):	

COMBUSTION CHAMBER AND FLUE GAS RECORDS

Type of waste / Parameters	Solid Waste, IMO Class 2	Waste Oil (sludge)
O_2 average in combustion chamber/zone		
CO average in flue gas		
Soot number average		
Combustion chamber flue gas outlet temperature average		
Amount of unburned components in ashes		