

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate no.:
MEDB00008VJ

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)
Logi2C, model TG1

issued to

TeamTec AS
Tvedestrand, Norway

is found to comply with the requirements in the following Regulations/Standards:

Regulation **(EU) 2023/1667**,
item No. **MED/2.7. Marpol 73/78 as amended, Annex VI Regulation 16, IMO Res. MEPC.244(66)**

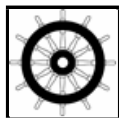
Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2029-06-23**.

Issued at **Høvik** on **2024-06-24**

DNV local unit:
West Norway CMC

Approval Engineer:
Anna Piotrowska



Notified Body
No.: **0575**

for **DNV AS**

Christine Mydlak-Röder
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 This certificate remains valid unless suspended, withdrawn, recalled or cancelled.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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

The Logi2C incinerator is intended for installation onboard ships and other marine installations for the incineration of oil residue (sludge) and solid waste, unless otherwise instructed by relevant Maritime Administration. The equipment is designed and tested to meet the requirements of the IMO Resolution MEPC.244(66).

The incinerator unit includes a combustion chamber with a diesel oil burner, a sludge burner and an electric control panel. The combustion chamber is of steel construction, lined with specially designed thermal shock material with a cooling air jacket.

In addition to the incinerator unit, a complete incinerator system includes a flue gas fan, a flue gas damper and exhaust pipe expansion units. The incinerator system may also include a spark arrestor an oil residue (sludge) service tank, a diesel oil service tank, and a sludge preparation tank. The oil residue (sludge) service tank may be delivered with an option for forced evaporation to reduce water mixture to achieve an improved combustibility.

The main electrical control panel fitted on the incinerator contains circuit breakers, starters, frequency inverter, PLC and operator panel. The operator panel is equipped with the LCD display touch screen for selecting burner programme modes and monitoring the burning process.

The Logi2C incinerator is designed as a Batch Loaded system. The oil residue (sludge) for incineration is collected in the sludge service tank, while the solid waste batch is loaded into the combustion chamber through the door system arranged with a safety interlock.

Application/Limitation

Application

The rated capacities of the Logi2C incinerator are listed below:

Model	Maximum capacity (kW)	Oil residue (sludge) capacity (l/h)	Solid waste (IMO Class 2) capacity (kg/h)
TG1	523.7	69.3	35.3

The incinerator is designed, programmed, and tested to reach 600°C within 5 minutes, meeting the requirements of IMO Resolution MEPC.244(66).

Limitations

Operational parameters applicable to the Logi2C incinerator:

Operating underpressure combustion chamber	10-35 mmWC
Operating temperature combustion chamber	850 - 1100 °C
Maximum temperature combustion chamber	1200 °C
Maximum ambient temperature	55 °C
Power supply	220V - 380/440V, 50/60Hz,

The equipment is not permitted to be installed in spaces subject to explosion hazards.

The optional free-standing fuel tank installation is allowed for cargo ships and special purpose ships with not more than 60 POB (people on board). If situated near to hot surfaces, the tanks shall be well insulated, and care shall be taken that the free air circulation is not impeded.

The design of the fuel and heating system with the associating piping is not covered by this type approval and must be evaluated for each installation.

The arrangement for the sounding pipes and level indicators shall be in accordance with DNV-RU-SHIP Pt.4 Ch.6.

The overflow and all drains from the sludge tank shall be led to ships' waste oil (sludge) system. If drains are led to ship's bilge system, manually operated self-closing valves with subsequent visual monitoring are required.

A copy of the Operation, Maintenance and Safety Manual for the Logi2C Incinerator shall be on board vessel at all times.

Type Examination documentation

Mechanical and Assembly Drawings:

Drawing Title	Drawing Number	Revision (date)
Sludge Oil Tank 385 L El. Heating Main Dimension	123066M	D (2021-02-25)
Sludge Oil Tank 385 L Assembly El. Heating	123066	D (2021-02-25)
Sludge Oil Tank 700 L Thermal oil Heating, Main Dimension	123334M	E (2024-06-07)
Sludge Oil Tank 700 L Assembly Thermal oil Heating	123334	E (2024-06-07)
Sludge Oil Tank 700 L Steam Heating Main Dimension	133128M	B (2024-06-07)
Sludge Oil Tank 700 L Assembly Steam Heating	133128	B (2024-06-07)
Sludge Oil Tank 700 L El. Heating Main Dimension	123324M	C (2020-11-06)
Sludge Oil Tank 700 L Assembly El. Heating	123324	C (2020-11-06)
Sludge Oil Tank 1000 L El. Heating Main Dimension	1389951M	A (2024-01-09)
Sludge Oil Tank 1000 L Assembly El. Heating	138951	A (2024-01-09)
Sludge Oil Tank 1100 L El. Heating Main Dimension	122869M	E (2020-11-10)
Sludge Oil Tank 1100 L Assembly El. Heating	122869	E (2020-11-10)
Sludge Oil Tank 1700 L El. Heating Main Dimension	122793M	B (2020-11-13)
Sludge Oil Tank 1700 L Assembly El. Heating	122793	B (2020-11-13)
Sludge Oil Tank 2000 L El. Heating Main Dimension	122935M	B (2020-11-27)
Sludge Oil Tank 2000 L Assembly El. Heating	122935	B (2020-11-27)
Sludge Oil Tank 3000 L Main Dimension Steam Heating	123190M	B (2024-06-07)
Sludge Oil Tank 3000 L Assembly Steam Heating	123190	B (2024-06-07)
Flue Gas Fan Main dimension	1011016M	C (2019-04-25)
Flue Gas Fan Assembly	1011016	C (2019-04-24)
Flue Gas damper Main dimension	1011017M	D (2022-01-11)
Flue Gas damper Assembly	1011017	D (2022-01-11)
Diesel Oil Tank 400L Assembly	1010623	F (2018-04-03)
Diesel Oil Tank 400L Main Dimension	101623M	F (2014-11-20)
Diesel Oil Tank 700L Assembly	1008275	G (2015-06-17)
Diesel Oil Tank 700L Main Dimension	1008275M	G (2015-06-17)
Burner, Logi	140956	0 (2024-04-25)
Combustion chamber, Logi	142077M	0 (2024-04-25)
Burner and dosage unit assembly, Logi	138839	A (2023-08-21)
Door for combustion chamber, Logi	142898	0 (2023-04-08)
Dosage tray assembly, Logi	138979	A (2023-08-22)
Inner door assembly, Logi	138852	A (2023-08-21)
Mounting drawing, CC, Logi	138792	A (2023-08-18)
Refractory and insulation Logi	141233	A (2024-03-22)

Piping and Instrumentation Drawings:

Drawing Title	Drawing Number	Revision (date)
Piping and Instrument Diagram LOGI2C	1012275	A (2024-04-24)

Electrical and Instrumentation Drawings:

Drawing Title	Drawing Number	Revision (date)
Starter Flue Gas Fan Logi	2010317	0 (2024-04-25)
Control Panel Logi	1012106	0 (2024-04-25)
Control Panel Sludge Tank with El. Heater Logi	1012162	0 (2024-04-25)
Burner Junction Box	1012137	0 (2024-04-25)

Operation and Maintenance Manuals:

Drawing Title	Drawing Number	Revision (date)
Operation, Maintenance and Safety Manual Logi Incinerator	36583	01 (2024-06-07)

Note on documentation supplied with the delivered product:

Additional letters identifying delivered options may be used in relation to the delivered equipment in manuals and communication with the client without influence on the certified product. These are described in the document "Declaration of Acceptable Options" listed in the Type Examination documentation.

Thus, the supplied order may have drawing numbers/revisions and software programme versions deviating from those listed in the certificate and still comply with the requirements, as confirmed by TeamTec AS in the Declaration of Conformity and the document "Declaration of Acceptable Options". The deviations are acceptable technical options and/or variables such as voltage or special requests for output signals from the PLC to ship systems.

For further information on the supplied order, see Declaration of Conformity issued by TeamTec AS.

Electrical and control components

Component Type	Component Name	Maker
Programmable Logic Controller (PLC)	PLC Base Unit Model TM221CE24R	Schneider Electric
Human Machine Interface (HMI)	Operator Terminal 7.5" Model HMIGTO4310	Schneider Electric

Changes to these components shall be approved by DNV. 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 Type	Software/Firmware (***)	Revision
Programmable Logic Controller (PLC)	Software Logi2C Models: PLC100.xxxx	-
	Firmware: V1.3.2	1
Human Machine Interface (HMI)	Software Logi2C Models: HMI100.xxxx	-
	Firmware: V1	1
(***) xxxx is identifying delivered options within the equipment and has no influence on capacity, emissions, or safety functions for the incinerators according to IMO Resolution MEPC.244(66).		

Changes in the software which can alter the performance of the system shall be approval by DNV. Note that testing of the system with the revised software may be required. Documentation confirming the approval (and any testing) shall be kept together with the certificate, or the certificate shall be updated.

Tests carried out

- Capacity and emissions test:
04-05 April 2024.at TeamTec AS, Molandsveien 4, Risør, Akland, Norway
TeamTec AS Report: Internal test report MEPC.244(66) for Logi incinerator Rev. 00 (2024-04-22)
Ecoxy Report: Emission measurements on Incinerator for TeamTec P0605_ 1421-R-01 (2024-06-24)
- Safety and control tests:
04 April 2024.at TeamTec AS, Molandsveien 4, Risør, Akland, Norway
Report: 36542_03 Test of alarm and safety functions Logi (2024-03-12)
- Oil residue (sludge):
Report: P 18352, Analysis of 2 samples of heavy fuel oil (2024-05-15)
Samples analyzed by: Petrotest,
Kilgaten 16, 3217 Sandefjord, Norway
- Solid waste ashes:
Report: EUNOKR-00060825_TT-051133-1, Unburned components in ash residue (2024-04-15)
Samples analyzed by: Eurofins Environment Testing Norway,
Aegirsvei 10, NO-4632 Kristiansand

Marking of product

The marking shall give the following information:

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

A copy of this certificate should be carried on board a vessel fitted with this equipment at all times.

Revision history

Revision	Date of issuance	Description
0	2024-06-24	Initial certificate

APPENDIX – Summary of capacity and emission test results

Form of IMO type approval certificate for shipboard incinerators with capacities of up to 4,000 kW

This is to certify that the shipboard incinerator listed has been examined and tested in accordance with the Standard for Shipboard Incinerators for disposing of ship-generated waste, as amended by IMO Resolution MEPC.244(66), and as required by regulation 16.6.1 of MARPOL Annex VI.

Capacity test data:

Parameters / Type of waste	Oil residue (sludge)	Solid waste (IMO Class 2)
Max. capacity	523.7 kW (69.3 l/h)	508 kW (35.3 kg/h)

Combustion chamber and flue gas records:

Parameters / Type of waste	Oil residue (sludge)	Solid waste (IMO Class 2)
O ₂ average in combustion chamber	11.02 %	10.62 %
CO average in flue gas	12.5 mg/MJ	18.8 mg/MJ
Soot number average	2 Bacharach	1 Bacharach
Combustion chamber flue gas outlet temperature average	1097 °C	934 °C
Amount of unburned components in ashes	-	0.35 % by weight

Pre-heating for batch loaded incinerators:

Parameter / Type of waste	Oil residue (sludge)	Solid waste (IMO Class 2)
Measured time after start, until the temperature in the actual combustion space reached 600 °C	1min and 1 second	50 seconds

Shock-cooling of flue gas:

Temperature of the flue gas should be shock-cooled to a maximum 350°C within 2.5 m from the combustion chamber flue gas outlet.

Parameters/ Type of waste	Oil residue (sludge)	Solid waste (IMO Class 2)
Temperature	273 °C	277 °C
Distance	2.5 m	2.5 m

Incinerator surface temperature:

Outside surface temperature of the incinerator casing during normal operations should not exceed 20°C above ambient temperature.

Parameters/ Type of waste	Oil residue (sludge)	Solid waste (IMO Class 2)
Temperature	23.6 °C (ambient temp. 22.0 °C)	21.6 °C (ambient temp. 20.7 °C)