Certificate no.:
TAP00002YJ

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Sewage Treatment Plants

with type designation(s)
DELTA STPN-800

issued to
DESARROLLO TECNICAS INDUSTRIALES DE GALICIA, S.A
Narón, A Coruña, A Coruña, Spain

is found to comply with

IMO Resolution MEPC.227(64) "2012 GUIDELINES ON IMPLEMENTATION OF EFFLUENT STANDARDS AND PERFORMANCE TESTS FOR SEWAGE TREATMENT PLANTS" with the exception of Section 4.2

Application:

Product(s) approved by this certificate may be accepted for installation on all vessels to demonstrate compliance with MARPOL Annex IV Regulation 9. Acceptance is subject to confirmation from the Flag Administration of the vessel the product is installed on.

Limitations imposed are described in this document.

Note: For vessels with EU Flag, EU Marine Equipment Directive (MED) certificates are required instead of this Type Approval certificate.

Issued at **Høvik** on **2024-12-18**
This Certificate is valid until **2025-06-10**.
DNV local unit: **NB/CMC Team West**

for **DNV**

Approval Engineer: **Michael Lehmann**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

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 USD 300 000.

Product description

The STPN-800 Sewage Treatment Plant is intended for installation onboard ships and offshore units for sewage treatment meeting the requirements specified in IMO Resolution MEPC.227(64) with the exception of section 4.2.

The STPN-800 Sewage Treatment Plant uses a biological process to treat the sewage. The sewage enters a Collecting and Aeration Tank which is supplied with air to stimulate bacteria growth and treat the sewage through an aerobic process. The process liquid is transferred through a screen to the Settling Tank where suspended solids and particles are separated. Sewage Sludge from the Settling Tank can be returned to the Collecting and Aeration Tank to feed the biological process. The process liquid is then transferred to a Disinfection Tank where sodium chlorine is used for disinfection. Before discharge, sodium bisulphite is added to remove residual chlorine from the effluent. The treated liquid is then discharged using the discharge pump.

Sewage Sludge is collected in each tank and is removed periodically using the discharge pump.

Application/Limitation

Application

Applicable models covered in this certificate are listed below:

Model	Hydraulic loading [litres/day]	Organic loading BOD_5 without nitrification [kg/day]
STPN-800	8 000	2.29

Limitations

The STPN-800 Sewage Treatment Plant is not certified for use on passenger ship intending to discharge sewage effluent in special areas (ref. IMO Resolution MEPC.227(64) Section 4.2).

Sewage Sludge shall be discharged according to the procedures described in the Operation and Maintenance Manual.

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

The ship shall have on board at all times a copy of the Operation and Maintenance Manual listed under Type Approval documentation.

Control and monitoring equipment

Software version

The STPN-800 Sewage Treatment Plant is type approved with the system control software version STPN250-2590PLCSFT_VA_R1 (PLC) and STPN250-2590TSSFT_VA_R0 (HMI). Any changes to the software are to be recorded as long as the STPN-800 Sewage Treatment Plant is in use onboard. 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. Testing of the application functions of the revised software may be required.

Electrical and electronic components

The type approved STPN-800 Sewage Treatment Plant shall include the control and monitoring equipment indicated on the flow diagram and the control panel equipment list specified under Type Approval documentation. Alternate models to the ones specified on the component lists may be used provided that information regarding the selected components is part of the documentation related to the specific installation, by providing either a reference to a valid type approval certificate or technical documentation demonstrating that the selected component was subject to environmental testing as per IACS UR E10.

For the following electrical and electronic components only the models specified below shall be used. Changes made to these components shall be approved by DNV in advance:

Component	Manufacturer	Model
Programmable Logic Controller (PLC)	OMRON	CP2E-S30DR-A
Human Machine Interface (HMI)	OMRON	NB5Q-TWOO-B

Type Approval documentation

Drawings and system documents

Type	Title	Drawing no.	Rev.
Flow diagram	"DELTA-BIO" STPN-250/2590 "A" Flow Diagram	STPN-250/2590A-F01	0 (07.2019)
General arrangement drawing	"DELTA-BIO" STPN-800 "A" General Arrangement and Interfaces	STPN-800A-G01	1 (18.02.2020)
Electrical diagrams	"DELTA-BIO" STPN "A" Power Diagram	STPN-000A-E01	1 (25.05.2020)
	"DELTA-BIO" STPN-420/2590 "A" Control Diagram	STPN-420/2590A-E02	1 (26.09.2022)
	"DELTA-BIO" STPN "A" Wiring Diagram	STPN-000A-E03	2 (25.05.2020)
	"DELTA-BIO" PRBN/STPN "A" Control Panel and Components List	PRBN/STPN-000A-E04	3 (09.10.2024)
Operation and Maintenance Manuals	Instruction Manual STPN Sewage Treatment Plants	STPN-000-02	10 (01.2020)

Test plans and reports

- Type Approval of Pollution Prevention Equipment according to IMO MEPC.227(64), Testing of the Operational Performance, Equipment Tested: STPN-420. Dated 16.12.2015.
- Type Approval of Pollution Prevention Equipment according to IMO MEPC.159(55), Testing of the Operational Performance, Equipment Tested: STPN-4050. Dated 23.04.2014.
- IMO Res.MEPC.227(64) compliance: STPN-4050, dated 26.01.2015.
- Test Report Sewage Treatment Plant DELTA PRM-21, Electric Panel (E04I), Reference Standard MEPC 49/22/Add.2 Annex 13, Part 3 Specification for Environmental Testing for Type Approval of Pollution Prevention Equipment. AT4 Wireless S.A., Report 37023REA.001, dated 09.10.2012.
- Environmental Test of STPN-4050 control panel. Justification of compliance with IMO MEPC 159(55). Dated 18.12.2014.
- Test Report Control Electrical Panel, Control No. 64789/01, Specification IMO Resolution MEPC.107(49) Part 3 Environmental Testing. Dekra Testing and Certification S.A.U, Report NIE: 62890RSE.001, dated 01.06.2020.

Tests carried out

Performance tests

Testing in accordance with IMO Resolution MEPC.227(64), excluding Section 4.2 for passenger ship intending to discharge sewage effluent in special areas, with the STPN 420 and STPN 4050 models of the STPN series of Sewage Treatment Plants in 2015 by Desarrollo Tecnicas Industriales de Galicia S.A. and witnessed by ABS

Environmental tests

Environmental testing in accordance with IMO Resolution MEPC 159(55) in 2014 and Part 3 of MEPC.107(49) in 2020

Marking of product

For traceability to this type approval, each unit is to be marked with: -

- Manufacturer's name or trademark
- Type designation
- Serial number and date of manufacture
- Hydraulic loading
- Any operational or installation limits considered necessary by the manufacturer or the Administration

Periodical assessment

For retention of the Type Approval, DNV surveyor shall perform periodical assessments to verify that the conditions of the TA are not altered since the certificate was issued. The scope of periodical assessment includes:

- Review of the TA documentation and verification that the documentation is still used as basis for the production
- Review of possible changes in design, material and performance of the product.
- Verification of the company's production and quality systems ensuring continued consistent production of the type approved products to the required quality.
- Verification that the product marking for identification and traceability to the TA Certificate is not altered.

Copy of type approval certificate

A copy of this Type Approval Certificate shall be carried on board a vessel fitted with this STPN-800 Sewage Treatment Plant for inspection on board the ship. A reference to the test protocol and a copy of the test results should be available for inspection onboard the vessel.

Revision history

Rev.	Date of issuance	Description
-	2024-12-18	Initial Type Approval certificate based on MED certificates MEDB000064W and MEDD00001Z9 (revision 5) issued by DNV

APPENDIX – SUMMARY OF TESTING WITH STPN 420 Sewage Treatment Plant

Test results and details of tests conducted on samples from the sewage treatment plant in accordance with resolution MEPC.227(64) excluding Section 4.2 for Passenger Ships in Special Areas:

Sewage treatment plant type: .....

Manufactured by: .....

Organization conducting the test: .....

Organization handling the samples: .....

Test Location: .....

Designed hydraulic loading: .....

Designed organic loading: .....

No. of effluent samples tested: .....

No. of influent samples tested: .....

Total suspended solids influent quality: .....

Total nitrogen influent quality:
- Geometric mean:
- Maximum
- Minimum .....

Total phosphorus influent quality:
- - Geometric Mean:
- - Maximum:
- - Minimum: .....

BOD_5 without nitrification influent quality: .....

Maximum hydraulic loading: .....

Minimum hydraulic loading: .....

Average hydraulic loading (Qi): .....

Effluent flow (Qe): .....

Dilution compensation factor (Qi/Qe): .....

Geometric mean of total suspended solids: .....

Geometric mean of the thermotolerant coliform count: .....

Geometric mean of BOD5 without nitrification: .....

Geometric mean of COD: .....

Geometric mean of total nitrogen:
Percentage reduction of total nitrogen: .....

Geometric mean of total phosphorus:
Percentage reduction of total phosphorus: .....

Maximum pH: .....

Minimum pH: .....

Type of disinfectant used: .....
If Chlorine - residual Chlorine:

Maximum: .....

Minimum: .....

Geometric mean: .....

Was the sewage treatment plant tested with:

Fresh water flushing? .....

Salt water flushing? .....

Fresh and salt water flushing? .....

Grey water added? .....

Was the sewage treatment plant tested against the environmental conditions specified in section 5.9 of resolution MEPC.227(64):

Temperature: .....

Humidity: .....

Inclination: .....

Vibration: .....

Reliability of Electrical and Electronic Equipment: .....

Limitations and the conditions of operation are imposed:

Salinity: .....

Temperature: .....

Humidity: .....

Inclination: .....

Vibration: .....

Results of other parameters tested: .....

APPENDIX – SUMMARY OF TESTING with STPN 4050 Sewage Treatment Plant

Test results and details of tests conducted on samples from the sewage treatment plant in accordance with resolution MEPC.227(64) excluding Section 4.2 for Passenger Ships in Special Areas:

Sewage treatment plant type: .....

Manufactured by: .....

Organization conducting the test: .....

Organization handling the samples: .....

Test Location: .....

Designed hydraulic loading: .....

Designed organic loading: .....

No. of effluent samples tested: .....

No. of influent samples tested: .....

Total suspended solids influent quality: .....

Total nitrogen influent quality:
- Geometric mean:
- Maximum
- Minimum .....

Total phosphorus influent quality:
- - Geometric Mean:
- - Maximum:
- - Minimum: .....

BOD5 without nitrification influent quality: .....

Maximum hydraulic loading: .....

Minimum hydraulic loading: .....

Average hydraulic loading (Qi): .....

Effluent flow (Qe): .....

Dilution compensation factor (Qi/Qe): .....

Geometric mean of total suspended solids: .....

Geometric mean of the thermotolerant coliform count: .....

Geometric mean of BOD5 without nitrification: .....

Geometric mean of COD: .....

Geometric mean of total nitrogen:
Percentage reduction of total nitrogen: .....

Geometric mean of total phosphorus:
Percentage reduction of total phosphorus: .....

Maximum pH: .....

Minimum pH: .....

Type of disinfectant used: .....
If Chlorine - residual Chlorine:

Maximum: .....

Minimum: .....

Geometric mean: .....

Was the sewage treatment plant tested with:

Fresh water flushing? .....

Salt water flushing? .....

Fresh and salt water flushing? .....

Grey water added? .....

Was the sewage treatment plant tested against the environmental conditions specified in section 5.9 of resolution MEPC.227(64):

Temperature: .....

Humidity: .....

Inclination: .....

Vibration: .....

Reliability of Electrical and Electronic Equipment: .....

Limitations and the conditions of operation are imposed:

Salinity: .....

Temperature: .....

Humidity: .....

Inclination: .....

Vibration: .....

Results of other parameters tested: .....