

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

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 GL AS under the authority of the Government of Norway.

This is to certify:

That the Sewage systems

with type designation(s)

Delta Type "FQN-15", "FQN-24" and "FQN-36"

Issued to

DESARROLLO TECNICAS INDUSTRIALES DE GALICIA, S.A
LA CORUÑA, Spain

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

Regulation **(EU) 2019/1397,**

item No. MED/2.6. Marpol 73/78 as amended, Annex IV Regulation 9, IMO Res. MEPC.227(64)
with the exception of Section 4.2.

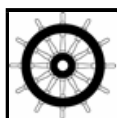
Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2025-03-26.**

Issued at **Høvik** on **2020-03-27**

DNV GL local station:
NB/CMC Team West

Approval Engineer:
Thomas Grafton



Notified Body
No.: **0575**

for **DNV GL AS**

Roald Vårheim
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 GL 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 This certificate remains valid unless suspended, withdrawn, recalled or cancelled.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 FQN Series of Sewage Treatment Plants are intended for installation onboard ships and offshore units for sewage treatment meeting the requirements specified in IMO Res. MEPC.227(64).

The FQN Series uses a physical-chemical process to treat the sewage using homogenisation, filters, chemical treatment with a coagulant/flocculant, and disinfection. The sewage enters a homogenisation tank where primary sludge is separated, the remaining process liquid is then passed through filters and a mixing coil where the coagulant/flocculant chemical is mixed together with the process liquid. The process liquid is then passed to the settling tank where it flows through a lamellar pack to further separate sludge. The remaining process liquid enters a disinfection tank where hypochlorite is added for disinfection. The treated water is then discharged.

Application/Limitation

Application: -

<i>Model</i>	<i>Hydraulic Loading (litres/day)</i>	<i>Organic Loading, BOD₅ without nitrification (kg/day)</i>
FQN-15	15,000	5.8
FQN-24	24,000	9.3
FQN-36	36,000	13.9

Installation Requirements: -

The shipyard shall provide the connections for discharge of sewage sludge as shown on the Flow Diagrams listed in the Type Examination documentation. These shall not be combined with the overboard discharge for treated sewage.

Limitations: -

The FQN Series is not certified for use on Passenger Ships in Special areas (ref. IMO Res.MEPC.227(64) Section 4.2).

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

The design of structural tanks constructed by the shipyard (e.g. Sludge Tank (Storage), etc.) are not evaluated as part of the type examination.

The ship should have on board at all times a copy of the Operation and Maintenance Manual listed in 'Type Examination documentation'.

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

Type Examination documentation

Sewage Vacuum Treatment Plant - FQN 15 - Flow Diagram	FQN-015-F01I	1 (02.2020)
Sewage Vacuum Treatment Plant FQN-24. Flow Diagram	FQN-024-F01I	2 (02.2020)
Sewage Vacuum Treatment Plant - FQN 36 - Flow Diagram	FQN-036-F01I	1 (02.2020)
Sewage Vacuum Treatment Plant - FQN 15 - General Arrangement & Interfaces	FQN-015-G01I	2 (03.2020)
Sewage Vacuum Treatment Plant FQN-24. General	FQN-024-G01I	2 (03.2020)

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Arrangement and Interfaces		
Sewage Vacuum Treatment Plant - FQN 36 - General Arrangement & Interfaces	FQN-036-G01I	1 (03.2020)
Sewage Vacuum Treatment Plant - FQN 15 - Control Panel	FQN-015-E04I	
Sewage Vacuum Treatment Plant - FQN-24 - Control Panel	FQN-024-E04I	0 (06.2010)
Sewage Vacuum Treatment Plant - FQN 36 - Control Panel	FQN-036-E04I	0 (07.2015)
Sewage Vacuum Treatment Plant - FQN 15 - Control Diagram	FQN-015-E02I	1 (02.2020)
Sewage Vacuum Treatment Plant - FQN 24 - Control Diagram		
Sewage Vacuum Treatment Plant - FQN 36 - Control Diagram	FQN-036-E02I	0 (07.2015)
Sewage Vacuum Treatment Plant - FQN 15 - Wiring Diagram	FQN-015-E03I	
Sewage Vacuum Treatment Plant FQN-24. Wiring Diagram	FQN-024-E03I	2 (02.2020)
Sewage Vacuum Treatment Plant - FQN 36 - Wiring Diagram	FQN-036-E03I	0 (07.2015)
Sewage Vacuum Treatment Plant - FQN 15 - Power Diagram	FQN-015-E01I	0 (07.2015)
Sewage Vacuum Treatment Plant FQN-24. Power Diagram	FQN-024-E01I	
Sewage Vacuum Treatment Plant - FQN 36 - Power Diagram	FQN-036-E01I	0 (07.2015)
Sewage Vacuum Treatment Plant - FQN 15 - Instruction Manual (MEPC.227(64))	FQN-015-02	2 (03.2020)

Tests carried out

Performance Tests: -

Environmental Test: -

Marking of product

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

- Manufacturer's name or trade mark
- Type and Model
- Serial No. and date of manufacture
- Hydraulic Loading
- Any operational or installation limits considered necessary by the manufacturer or the Administration

APPENDIX TO CERTIFICATE OF TYPE APPROVAL FOR SEWAGE TREATMENT PLANTS

Test results and details of tests conducted on samples from the sewage treatment plant in accordance with resolution MEPC.227(64) including 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:	

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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: _____