

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Application of: Council Directive 96/98/EC of 20 December 1996 on Marine Equipment as amended by directive 2014/93/EU, issued as "Forskrift om Skipsutstyr" by the Norwegian Maritime Directorate. This Certificate is issued by DNV GL AS under the authority of the Government of the Kingdom of Norway.

This is to certify:

That the Sewage systems

with type designation(s)

Models; Marinfloc STS 3, STS 6, STS 12, STS 24, STS 60, ASTS 3, ASTS 6, ASTS 12, ASTS 24, ASTS 60

Issued to

**Marinfloc AB
VAREKIL, Sweden**

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

Annex A.1, item No. A.1/2.6 and Annex B, Module B in the Directive. Marpol 73/78 as amended, Annex IV Regulation 9, IMO Res. MEPC.227(64)

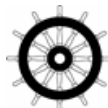
Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2020-01-13**.

Issued at **Høvik** on **2016-02-01**

DNV GL local station:
Gothenburg

Approval Engineer:
Pål Evang Nundal



Notified Body
No.: **0575**

for **DNV GL AS**

Vidar Dolonen
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 Council Directive 96/98/EC, as amended.

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.

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 STS/ASTS manufactured by Marinfloc AB are intended for installation onboard ships and offshore units for sewage treatment. The equipment consists of the following main components:

- Inlet tank; manufacturer: Yard/Marinfloc
- Coarse filter; manufacturer: Malmberg Water/Läckeby
- Circulation tank; manufacturer: Marinfloc
- Expansion tank; manufacturer: Yard/Marinfloc
- Flocculation unit; manufacturer: Marinfloc
- Filter; manufacturer: Marinfloc
- UV; manufacturer: Wallenius Water

The equipment is designed by Marinfloc AB and tested to meet the requirements of the IMO Resolution MEPC.227(64) without treatment of N and P. Marinfloc AB is responsible for the design, construction and performance of the sewage treatment plant in each installation according to MEPC.227(64).

The design of the bioreactor is not covered by the type examination.
The inlet tank, expansion tank and sludge tank are not part of the type-examination. Sizing of these tanks should be according to recommendations from Marinfloc AB.

Application

Sewage Treatment Plants;

Model:	Designed Capacity (m ³ /day):	Designed Organic Load, kg BOD5 / day
STS 3 & ASTS 3	3.0	1.5
STS 6 & ASTS 6	6.0	3.1
STS 12 & ASTS 12	12.0	6.2
STS 24 & ASTS 24	24.0	12.4
STS 60 & ASTS 60	60.0	30.9

Limitation

Marinfloc AB ASTS sewage treatment plants are certified for nitrogen and phosphorus removal (MEPC.227(64) Sec. 4.2)

Marinfloc AB STS sewage treatment plants are not certified for nitrogen and phosphorus removal (MEPC.227(64) Sec. 4.2). If installed on passenger ships, treated sewage cannot be discharged in special areas. This prohibition applies when this sewage treatment plant is installed on new ships on or after 1 January 2016, and on existing ships on or after 1 January 2018.

The type examination is limited to cover for the "treatment part" of the combined grey and black water system, and does not cover for other systems upstream and downstream.

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

Type Examination documentation

Drwg.No.; *Date/ Rev.;* *Title;*
Mechanical/ System;

Tests carried out

Marking of product

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

- Manufacturer's name or trade mark
- Type designation
- Serial No.
- Hydraulic loading
- Date of manufacture
- Any operational limits

Mark of Conformity

The manufacturer is allowed to affix the Mark of Conformity according to Article 11 in the Council Directive 96/98/EC on Marine Equipment and shall issue a Declaration of Conformity, only when the module D or E or F of Annex B in the same directive is fully complied with.

Module D: The quality system for production and testing shall be approved by the Notified Body.

Module E: The quality system for inspection and testing shall be approved by the Notified Body.

Module F: Compliance of the products to type as described in this EC Type-Examination Certificate must be verified by the Notified Body who also shall issue a Certificate of Conformity.

APPENDX 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):

General information

Sewage treatment plant, Type

Manufactured by

Organization conducting the test

Designed hydraulic loading

m³/day

Designed organic loading

kg/day BOD

Samples

Number of effluent samples tested

Number of influent samples tested

Influent

Total suspended solids influent quality

mg/l

Total nitrogen influent quality

mg/l as nitrogen*

Total phosphorus influent quality

mg/l as phosphorus*

BOD₅ without nitrification influent quality

mg/l

Flow

Maximum hydraulic loading

m³/day

Minimum hydraulic loading

m³/day

Average hydraulic loading (Q_i)

m³/day

Effluent flow (Q_e)

m³/day

Dilution compensation factor (Q_i/Q_e)

Effluent

Geometric mean of total suspended solids

mg/l

Geometric mean of thermotolerant coliform count

coliforms/100 ml

Geometric mean of BOD₅ without nitrification

mg/l

Geometric mean of COD

mg/l

Geometric mean of total nitrogen

mg/l* or %*

Geometric mean of total phosphorus

mg/l* or %*

Maximum pH

Minimum Ph

Type of disinfectant used

Was the sewage treatment plant tested with:

Fresh water flushing?

Salt water flushing?

Fresh and salt water flushing?

Grey water added?

Job Id: **344.1-003028-4**
Certificate No: **MEDB00000MB**

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

Theoretical Effluent		STS/ASTS3	STS/ASTS6	STS/ASTS12	STS/ASTS24	STS/ASTS60
BOD	mg/l					
COD	mg/l					
TSS	mg/l					
Nitrogen	mg/l					
Phosphorus	mg/l					