

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 ST-20U, ST-30U, ST-50U, ST-70U, ST-100U, ST-140U, ST-200U, ST-300U

Issued to

**Hansun(Shanghai) Marine Technology Co., Ltd
Shanghai,**

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)

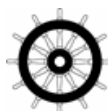
Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2020-01-18**.

Issued at **Høvik** on **2016-03-08**

DNV GL local station:
Nantong CMC

Approval Engineer:
Jens Rogge



Notified Body
No.: **0575**

for **DNV GL AS**

Vidar Dolonen
Head of Notified Body

Product description

The equipment is intended for installation onboard ships to provide sewage treatment for the protection of the marine environment.

The process of the sewage treatment plants are based upon a biological process of degrading and consists of macerating and discharge pumps, air blower, UV sterilizer, level switch, dosing pump and control cabinet.

The equipment is designed to meet the requirements of the IMO Resolution MEPC.227(64) without treatment of N and P. Hansun (Shanghai) Marine Technology Co., Ltd., is responsible for the design, construction and performance of the sewage treatment plant in each installation according to MEPC.227(64).

Application

The sewage treatment plant complies with MEPC.227(64) excluding section 4.2 for nitrogen and phosphorus removal.

Sewage Treatment Plants;

Model:	Designed Capacity (m3/day):	Designed Organic Load, Kg BOD5 / day:
ST-20U	2.0	1.5
ST-30U	3.0	2.0
ST-50U	5.0	3.3
ST-70U	7.0	4.8
ST-100U	11.0	7.2
ST-140U	14.0	9.5
ST-200U	21.0	14.3
ST-300U	30.0	20.0

Limitation

ST-20U, ST-30U, ST-50U, ST-70U, ST-100U, ST-140U, ST-200U, ST-300U 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.

Type Examination documentation

Mechanical/ System;

Drwg.No.;	Rev.;	Title;
0027-00LC9 A	(2014-08-29)	Sewage Treatment Unit, Flow Diagram
27-20-02-00	v1.2	Assembly drwg., ST-20U-B
27-20-02-00-01	v1.2	Assembly drwg., ST-20U-B
2720A -00	(A.0 2015-7-28)	Assembly drwg., ST-20U
2730A-00	(A.0 2015-7-28)	Assembly drwg., ST-30U
2735A-00	(A.0 2015-7-28)	Assembly drwg., ST-50U
2740A-00	(A.0 2015-7-28)	Assembly drwg., ST-70U
2750A-00	(A.0 2015-7-28)	Assembly drwg., ST-100U

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2760A-00	(A.0 2015-7-28)	Assembly drwg., ST-140U
2770A-00	(A.0 2015-7-28)	Assembly drwg., ST-200U
2780A-00	(A.0 2015-7-28)	Assembly drwg., ST-300U
2720A-00	(A.0 2015-7-28)	Tank Body dwg., ST-20U
2730A-00	(A.0 2015-7-28)	Tank Body dwg., ST-30U
2735A-00	(A.0 2015-7-28)	Tank Body dwg., ST-50U
2740A-00	(A.0 2015-7-28)	Tank Body dwg., ST-70U
2750A-00	(A.0 2015-7-28)	Tank Body dwg., ST-100U
2760A-00	(A.0 2015-7-28)	Tank Body dwg., ST-140U
2770A-00	(A.0 2015-7-28)	Tank Body dwg., ST-200U
2780A-00	(A.0 2015-7-28)	Tank Body dwg., ST-300U

Electrical;

Drwg.No.;	Rev.;	Title;
27-00-03-01	Ver 1.1 ST	Cable drwg.
27-00-03-02	Ver 1.1 ST	Cable drwg.
27-00-03-03	Ver 1.1 ST	Cable drwg.
27-00-03-04	Ver 1.1 ST	Cable drwg.
27-00-03-05	Ver 1.1 ST	Cable drwg.

Common Documents;
Instruction & Manual – HANSUN Marine Sewage Treatment Plant ST-XU, Rev. V1, dated 2008-11-27.

Technical Specification VCD-01; vacuum device and pump.

Technical data sheets, main components certificate list.

Operations Control;
The equipment will be controlled through PLC from Siemens AG, Type SIMATIC S7-200

Tests carried out

- Shanghai Environmental Monitoring Centre, Test Report No. WT20080306, dated 2008-07-16, Water Samples Analysis
- China Classification Society, Report No. SH08T00220, dated 2008-12-18
- Shanghai Inspection and Testing Institute of Instruments and Automatic Systems - SITIIS, Test Report No. A08-042-ZC, dated 2008.07.16,
Marine Sewage Plant Control Cabinet, Environmental Testing.

Marking of product

For traceability to this type approval, each unit is to be marked with;
-Manufacturer's name or trade mark
-Type designation and model identification
-Date of Manufacture
-Serial No.
-Design hydraulic loading
-Design organic loading
-Any operational limitations
-Mark of Conformity

APPENDIX TO CERTIFICATE OF TYPE APPROVAL FOR SEWAGE TREATMENT PLANTS

Tests 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:	ST-30U
Manufactured by:	Hansun (Shanghai) Marine Technology Co., Ltd.
Organization conducting the test:	Shanghai Environmental Monitoring center
Designed hydraulic loading:	3.0 m ³ /d
Designed organic loading:	2.0 kg/day BOD ₅

Samples

Number of effluent samples tested	40
Number of influent samples tested	10

Flow

Max hydraulic load	24 m ³ /d
Min hydraulic load	1 m ³ /d
Average hydraulic load (Q _i)	4 m ³ /d
Effluent flow (Q _e)	4 m ³ /d
Dilution factor (Q _i /Q _e)	1

Influent

TSS	>500 mg/l
TN	NA
TP	NA
BOD ₅ without nitrification	667 mg/l

Effluent

The following values are geometric mean calculations.

TSS	7.8 mg/l
Thermotolerant coliform	21.5 coliforms/100ml
BOD ₅ without nitrification	5.2 mg/l
COD	14.9 mg/l
TN	NA
TP	NA

pH

Max	8.18
Min	6.86

Disinfectant

Type	Chlorine
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Environmental conditions

Temperature	Yes
Humidity	Yes
Inclination	Yes
Vibration	Yes
Reliability of Electrical and Electronic Equipment	Yes

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Was the STP tested with:

Fresh water flushing?	Yes
Salt water flushing?	No
Fresh and salt water flushing?	No
Grey water added?	No

Limitations for the ST-30U

Salinity	-
Temperature	0°C - +55°C
Humidity	90%
Inclination	22.5°
Vibration	Freq 2-13Hz; 13.2-80Hz, 0.7g

Theoretical Effluent		ST-20U	ST-30U*	ST-50U	ST-70U	ST-100U	ST-140U	ST-200U	ST-300U
BOD	mg/l	≤25	5.2	≤25	≤25	≤25	≤25	≤25	≤25
COD	mg/l	≤125	14.9	≤125	≤125	≤125	≤125	≤125	≤125
TSS	mg/l	≤35	7.8	≤35	≤35	≤35	≤35	≤35	≤35