DNV·GL

Certificate No:
MEDB000015K

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Application of: Directive 2014/90/EU of 23 July 2014 on marine equipment (MED). This Certificate is issued by DNV GL SE based on the notification of the Federal Maritime and Hydrographic Agency of Germany.

This is to certify:

That the Sewage systems

with type designation(s)
TST - 15, 25, 35, 55, 85 Sewage Treatment Plant

Issued to
TBG Marintec Co.,Ltd.
Anqing, China

is found to comply with the requirements in the following Regulations/Standards:
Regulation **(EU) 2015/559,**
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 **2021-10-12**.

Issued at **Hamburg** on **2016-10-13**

DNV GL local station:
Wuhan CMC

Approval Engineer:
Jens Rogge

Notified Body
No.: **0098**

for **DNV GL SE**

Sven Dudszus
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 SE 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 This certificate remains valid unless suspended, withdrawn, recalled or cancelled.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.

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Product description

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

The sewage treatment system of type TST consist of a sewage collecting tank, subdivided in three treatment sections. The system consists further of aeration blower, discharge and sucking pump, UV sterilizer stage and piping system for aeration, cleaning and discharge as specified in system principle drawing TST25010000-ZA.

Type	Rated capacity [Persons]	Average hydraulic load [m^3/day]
TST-15	15	1.05
TST-25	25	1.75
TST-35	35	2.45
TST-55	55	3.85
TST-85	85	5.95

Application

Operation on ships, other than passenger ships, in all areas and passenger ships outside MARPOL Annex IV special areas.
The equipment is designed to meet the requirements of the IMO Resolution MEPC.227(64) excluding section 4.2 for nitrogen and phosphorus removal. TBG Marintec Co., Ltd. is responsible for the design, construction and performance of the sewage treatment plant in each installation according to MEPC.227(64).

Limitation

- The types TST-15, TST-25, TST-35, TST-55 and TST-85 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 a date determined by the IMO, but in no event prior to 1 June 2019, and on existing ships on or after a date determined by the IMO, but in no event prior to 1 June 2021.
- The STP shall be loaded according to the daily design loads in such a way that the hydraulic and organic loads are never exceeded.
- When the STP is used with vacuum toilets, adding water or grey water is allowed as long as the design hydraulic load is not exceeded and the influent content of total suspended solids (TSS) is still within the range of 300 - 700 mg/l (average of 500 mg/l).
- Installation of the equipment in spaces subject to explosion hazard is not permitted.

Type Examination documentation

Assembly drawing showing main dimentions and equipment arrangement			
Type	**Title**	**Doc.No.**	**Revision**
TST-15	TST-15	TST15110000	ZZ
TST-15	NBR	TST15140100	ZZ
TST-15	NBR	TST15140200	ZZ
TST-25	TST-25	TST25110000	ZA
TST-25	TST-25	TST25120000	ZA
TST-25	TST-25	TST25120100	ZA
TST-25	TST-25	TST25120200	ZA
TST-25	TST-25	TST25140000	ZA
Assembly drawing showing main dimentions and equipment			

arrangement			
Type	**Title**	**Doc.No.**	**Revision**
TST-25	NBR	TST25140200	ZA
TST-25	TST-25	TST25140100	ZA
TST-25	Principle Drawing of Sewage Treatment Plant	TST25010000	ZC
TST-25	TST-25	TST25000000	ZA
TST-35	TST-35	TST35110000	ZZ
TST-35	NBR	TST35140200	ZZ
TST-35	TST-35	TST35140100	ZZ
TST-55	TST-55	TST55110000	ZZ
TST-55	TST-55	TST55120100	ZZ
TST-55	TST-55 NBR	TST55120200	ZZ
TST-55	TST-55	TST55140100	ZZ
TST-85	TST-85	TST85110000	ZZ
TST-85	TST-85	TST85140100	ZZ
TST-85	TST-85 NBR	TST85140200	ZZ
TST-85	TST-85	TST85140200	ZZ
	Main Part List	TST-25Z-01	
TST-25	Outline drawing		
TST-15, TST-25, TST-35, TST-55, TST-85	TST Marine Sewage Treatment Plants, Main Performance Specifications	HMC00-TST-C-203	
	Aeration Calculation Sheet	AHMC00-TST-C-202	
	Inspection Test Program	AHMC00-TST-C-204	B/0
Electrical system and instrumentation layout and diagrams and list of components			
Type	**Title**	**Doc.No.**	**Revision**
	Electrical Drawing of Sewage Treatment Plant	TST25030100	ZB
Drawings of warning plates and instruction plate			
Type	**Title**	**Doc.No.**	**Revision**
TST-25	Parameter Nameplate	TST25130500	ZC
TST-25	Attention Labels	TST25130600	ZB
Operation, installation and maintenance manual with drawings, electric diagrams, spare-part lists etc. and including routine maintenance			
Type	**Title**	**Doc.No.**	**Revision**
TST-15, TST-25, TST-35, TST-55, TST-85	TST MARINE SEWAGE TREATMENT PLANTS, INSTRUCTION MANUAL	AHMCOO-TST-M-204	
	Sewage treatment plant operation notice		

Tests carried out

Testing Report no. WT 20110070 of Shanghai Environmental Monitoring Center dated 2011-03-15
Ship Test 2011-007 (1) TBECB Sewagetreatment Plants Electrical Control-box dated 2011-04-06
Ship Test 2011-007 (2) UV-Sterilieser (Vibration Test) dated 2011-04-06
Repot of TST Marine Sewage Treatment Plant Inspection Test Program, AHMC00-TST-C205 dated 2011-06-04

Marking of product

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

This certificate replaces certificate no. 19 535-11HH

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:	TST-25
Manufactured by:	TBG Marintec Co., Ltd.
Organization conducting the test:	Shanghai Environmental Monitoring Center
Designed hydraulic loading:	1.75 m^3/d
Designed organic loading:	0.875 kg/day BOD5

Samples

Number of effluent samples tested	52
Number of influent samples tested	52

Flow

Max hydraulic load	1.81 m^3/d
Min hydraulic load	1.77 m^3/d
Average hydraulic load (Qi)	1.79 m^3/d
Effluent flow (Qe)	1.79 m^3/d
Dilution factor (Qi/Qe)	1.0

Influent

TSS	>500 mg/l
TN	NA
TP	NA
BOD5 without nitrification	848 mg/l

Effluent

The following values are geometric mean calculations.

TSS	8.8 mg/l
Thermotolerant coliform	36.9 coliforms/100ml
BOD5 without nitrification	6.0 mg/l
COD	52.7 mg/l
TN	NA
TP	NA
pH	
Max	7.89
Min	6.49

Disinfectant

Type	Ultraviolet radiation

Environmental conditions

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

The STP was tested with:

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

Limitations for the TST-25

Salinity	no more than 35000 mg/l in water
Temperature 0°C -	5~32°C (Raw sewage); 5~50°C (Environment)
Humidity	≤ 90%
Inclination	≤ 22.5°
Vibration	2-13 Hz with an amplitude of ± 1mm and 13.2 to 80 Hz with an acceleration of ± 0.7g