

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate No:
MEDB000068H

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 AS under the authority of the Government of Norway.

This is to certify:

That the Oil-filtering equipment (for an oil content of the effluent not exceeding 15 p.p.m.)

with type designation(s)
RK-015, RK-05, RK-2, RK-3, RK-5

Issued to

Sasakura Engineering Co., Ltd.
Osaka, 27, Japan

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

Regulation (EU) 2020/1170,
item No. MED/2.1. Marpol 73/78 as amended, Annex I Regulation 14, IMO Res. MEPC.107(49), IMO
MEPC.1/Circ. 643

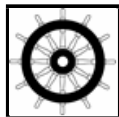
Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2026-05-02**.

Issued at **Høvik** on **2021-05-03**

DNV local station:
Kobe

Approval Engineer:
Thomas Grafton



Notified Body
No.: **0575**

for **DNV AS**

Sverre Olav Bergli
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 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 This certificate remains valid unless suspended, withdrawn, recalled or cancelled.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.

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 300,000 USD.



Product description

The RK Series 15 ppm Bilge Water Separator is intended for installation onboard ships or other marine units to reduce the oil content in bilge water to less than 15 ppm.

The bilge water separator uses gravity separation with coalescers and a filter to separate the oil. The oil is separated according to the following stages: 1) bilge water enters a gravity separation chamber where larger oil particles are separated by gravity to an oil sump; 2) the remaining oily water passes through a coalescer and oil particles are separated to the oil sump; 3) the remaining oily water is passed through a filter to remove suspended solids and a second coalescer in an emulsion breaking chamber; 4) the separated oil is collected and discharged from the oil sumps when an oil level sensor is triggered; and 5) the cleaned water is discharged from the separator.

Application

The models covered by this certificate are listed below:

Model	Max Flowrate (m ³ /h)	Maximum Supply Pump Capacity (*) (m ³ /h)
RK-015	0.15	0.165
RK-05	0.5	0.55
RK-2	2.0	2.2
RK-3	3.0	3.3
RK-5	5.0	5.5

(*) The RK Series are not delivered with a supply pump from the factory. The buyer must install a supply pump according to the specification of Sasakura Engineering Co., Ltd. and the pump capacity shall not exceed the maximum capacity stated in the table.

Limitations

Limitations applicable to all models are listed below:

<i>Applicable to all Models</i>	
Operating Pressure:	0.3MPa (Max.)
Operating Temperature of Bilge Water:	0 - 60 °C
Power Supply:	AC 100/110/115V x 50/60Hz AC 200/220/230V x 50/60Hz
Inclination Range:	0 to 22.5 degrees

When required by MARPOL Annex I Reg.14.7, the unit shall be integrated with a 15ppm Oil Content Monitor complying with IMO Res.MEPC.107(49). This Oil Content Monitor shall be provided with a separate EU Marine Equipment Directive Type Approval Certificate.

The 15ppm Oil Content Monitor shall be installed as described in the Piping Arrangement Drawings listed in the Type Examination Documentation. The valve in the "Sampling W. Inlet" to the "15ppm(5ppm) Bilge Alarm" shall be kept open in normal operation (see "Note" on the drawing).

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

Installation

The following items shall be verified on the final installation (15ppm Bilge Separator and 15ppm Oil Content Monitor): -

1. An alarm signal in the Oil Content Monitor is activated whenever clean water is used for cleaning or zeroing purposes
2. Any alarm signal will activate the Automatic Stopping Device preventing overboard discharge and lead to recirculation
3. The overall response time (including the response of time of the 15ppm Oil Content Monitor) between an effluent discharge from the 15ppm Bilge Separator exceeding 15ppm, and the operation of the Automatic Stopping Device preventing overboard discharge, shall be not more than 20 seconds
4. Every access of the Oil Content Monitor (beyond check on instrument drift, repeatability of the instrument reading, and the ability to re-zero the instrument) requires breaking of a seal.

Electrical and control components

The RK Series is controlled by components that have been subjected to Environmental Testing. Critical components are listed in the table below:

<i>Component name and model</i>	<i>Maker</i>
Capacitive Level Sensor, model KSV-26N	Nohken Inc. Japan
Junction Box, model CG-TB1	Nohken Inc. Japan
Motor Valve, model MXBI	CKD Corporation, Japan

Changes to these components shall be approved by DNV and documentation confirming the approval shall be kept together with the certificate, or the certificate shall be updated.

Type Examination documentation

Piping and Instrumentation Diagram

<i>Drawing Name</i>	<i>Drawing Number</i>	<i>Revision</i>
Piping arrangement drawing	A550810150	3 (21.04.2021)

Arrangement Drawings and Parts List

<i>Drawing Name</i>	<i>Drawing Number</i>	<i>Revision</i>
Model RK-015 (0.15m ³ /h) External Arrangement	A550810031	1 (12.03.2021)
Model RK-05 (0.5m ³ /h) External Arrangement	A550810032	1 (12.03.2021)
Model RK-2 (2m ³ /h) External Arrangement	A550810033	1 (12.03.2021)
Model RK-3 (3 m ³ /h) External Arrangement	A550810039	0 (12.03.2021)
Model RK-5 (5m ³ /h) External Arrangement	A550810034	1 (12.03.2021)
1st coalescer	A550810701	1 (12.03.2021)
2nd coalescer	A550810702	2 (12.03.2021)
SS filter	A550810703	2 (12.03.2021)
Type: RK-015 to RK-5, Main Parts Dimension	A550810035	1 (12.03.2021)
Type: RK-015 to RK-5, Sectional Drawing & Parts List	A550810036	2 (12.03.2021)

Electrical and Control Drawings

<i>Drawing Name</i>	<i>Drawing Number</i>	<i>Revision</i>
Outline Drawing of Junction Box CG-TB1	AS 111045	0 (13.07.2020)
Outline drawing of capacitive level sensor (Oil Sensor) KSV-26N	AS111044	0 (01.07.2020)
Motor valve	F3-832940-A-2	2 (09.03.2009)
Wiring diagram of capacitive level sensor and motor valve	A550810051	0 (13.11.2020)

Instruction Manual

<i>Drawing Name</i>	<i>Drawing Number</i>	<i>Revision</i>
Instruction Manual, Type: RK-015, 05, 2, 5, Edition 1	A550810960	0 (28.07.2020)

Other drawings

<i>Drawing Name</i>	<i>Drawing Number</i>	<i>Revision</i>
Functional description & description of automatics and fail-safe	A550810100	0 (06.2020)
Name Plate (Class Programme DNVGL-CP-0208)	A550810052	0 (01.12.2020)

Test Plans

<i>Test Plan Name</i>	<i>Number</i>	<i>Revision</i>
Environmental Test Procedure for Level Sensor	A550810921	0 (11.06.2020)
Type Approval Test Procedure of 5/15ppm Bilge Separator, Type : RK (Performance Test)	55-19-003	3 (12.03.2021)

Basis of acceptance

The RK-015 and RK-5 Bilge Water Separators have been subjected to performance testing according to IMO Res.MEPC.107(49), Annex Part 1. The test reports are listed in the "Test Reports" section of this certificate and the test results are given in the appendices to this certificate.

The electrical and electronic sections of the bilge water separator have been subjected to environmental testing according to IMO Res.MEPC.107(49), Annex Part 3 and the reports are listed in the "Test Reports" section of this certificate.

The series of Bilge Water Separators with capacities from 0.15 m³/h to 5.0 m³/h use the same basic design. Therefore, testing on the RK-015 (0.5 m³/h) model and the RK-5 model (5 m³/h) is considered to sufficient to cover all models (ref. IMO Res.MEPC.107(49), paragraph 1.1.4).

Tests reports

Performance Tests

Report	Number	Revision
5ppm Bilge Separator. Type: RK-015 to RK-5, Performance Test Result	A550810922	1 (21.04.2021)

Environmental Tests

Report	Number	Revision
Test Report on Environmental Test - Capacitive Level Sensor KSV-26N, Junction Box CG-TB1, Japan Ship Machinery Quality Control Association, Research Institute of Marine Engineering (RIME).	20-213(E)	0 (21.10.2020)
Test Report on Environmental Test, Motor Valve, Japan Ship Machinery Quality Control Association, Research Institute of Marine Engineering (RIME).	04-166(E)	28.07.2004

Marking of product

The marking shall give at least the following information:

- Identification of manufacturer
- Equipment type designation or model identification
- Maximum throughput and maximum influent pressure at which the separator is designed to operate
- Serial number
- Revision information, as applicable, for all firmware or software modules installed per hardware unit, necessary to identify the equipment.

Copy of the Type Approval Certificate and Operational Manual

A vessel fitted with a 15 ppm bilge separator shall, at all times, have on board a copy of the operation, installation and maintenance manual.

A copy of this certificate should be carried aboard a vessel fitted with this separator at all times.

Revision history

Revision	Issue Date	Reason for revision
0	2021-05-03	Initial certificate.

APPENDIX – RK-015

Test data and results of tests conducted on a 15 ppm Bilge Separator in accordance with Part 1 of the Annex to the Guidelines and Specifications contained in IMO Resolution MEPC.107(49).

15 ppm Bilge Separator submitted by:

Tested type:

Test location:

Date:

Organisation conducting the test:

Organisation responsible for taking samples:

Samples analysed by:

Method of sample analysis:

Test rig according to drawing:

Environmental testing of the electrical and electronic sections of the 15 ppm Bilge Separator has been carried out in accordance with part 3 of the annex to the guidelines and specifications contained in IMO Resolution MEPC.107(49). The equipment functioned satisfactorily on completion of each test specified on the environmental test protocol.

Environmental test carried out at **Japan Ship Machinery Quality Control Association, Research Institute of Marine Engineering (RIME)**., Test report No: **04-166(E) and 20-213(E)**, issued at **Tokyo, Japan** on **28.07.2004 and 21.10.2020**.

Manufacturer's recommendations and information concerning the use of cleansing agents:

Test fluid "A"

Density at 15 °C:

Viscosity at 100 °C:

Flashpoint:

Ash content:

Water content at start of test:

Test fluid "B"

Density at 15 °C:

Viscosity at 40 °C:

Flashpoint:

Ash content:

Water content at start of test:

Test fluid "C"

Surfactant:

Iron Oxides:

Test water

Density at 20 °C:

Solid matter present:

Test temperature

Ambient:

Test fluid "A":

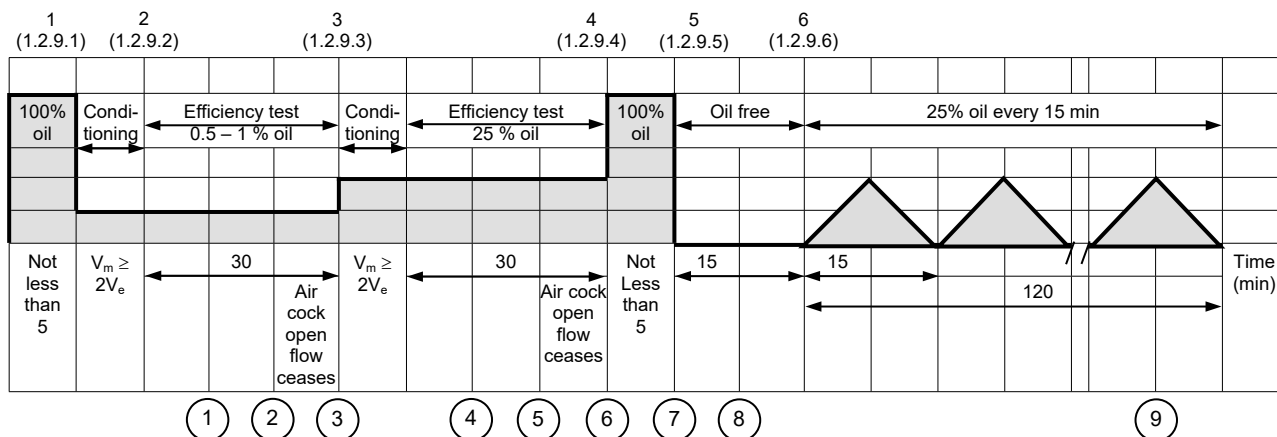
Test fluid "B":

Test fluid "C":

Test water:

TEST RESULTS AND TEST PROCEDURES

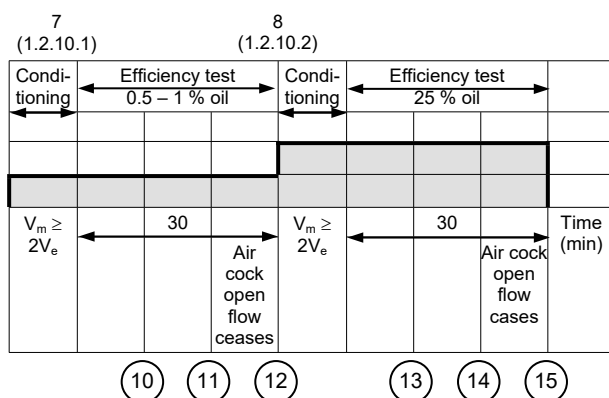
TEST FLUID "A"



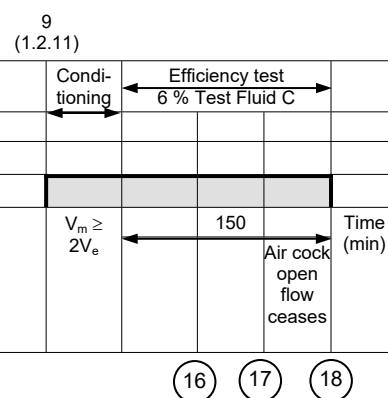
Test sample 9 (taken at the end of auto test, paragraph 1.2.9.6 Annex to resolution MEPC.107(49))

	1	2	3	4	5	6	7	8	9
Influent (%)									
Effluent (ppm)									

TEST FLUID "B"



TEST FLUID "C"



	10	11	12	13	14	15	16	17	18
Influent (%)									
Effluent (ppm)									

V_e - volume of oily water separator (OWS)
V_m - oil/water mixture passed through OWS

APPENDIX – RK-5

Test data and results of tests conducted on a 15 ppm Bilge Separator in accordance with Part 1 of the Annex to the Guidelines and Specifications contained in IMO Resolution MEPC.107(49).

15 ppm Bilge Separator submitted by:

Tested type:

Test location:

Date:

Organisation conducting the test:

Organisation responsible for taking samples:

Samples analysed by:

Method of sample analysis:

Test rig according to drawing:

Environmental testing of the electrical and electronic sections of the 15 ppm Bilge Separator has been carried out in accordance with part 3 of the annex to the guidelines and specifications contained in IMO Resolution MEPC.107(49). The equipment functioned satisfactorily on completion of each test specified on the environmental test protocol.

Environmental test carried out at **Japan Ship Machinery Quality Control Association, Research Institute of Marine Engineering (RIME)**., Test report No: **04-166(E) and 20-213(E)**, issued at **Tokyo, Japan** on **28.07.2004 and 21.10.2020**.

Manufacturer's recommendations and information concerning the use of cleansing agents:



Test fluid "A"

Density at 15 °C:

Viscosity at 100 °C:

Flashpoint:

Ash content:

Water content at start of test:

Test fluid "B"

Density at 15 °C:

Viscosity at 40 °C:

Flashpoint:

Ash content:

Water content at start of test:

Test fluid "C"

Surfactant:

Iron Oxides:

Test water

Density at 20 °C:

Solid matter present:

Test temperature

Ambient:

Test fluid "A":

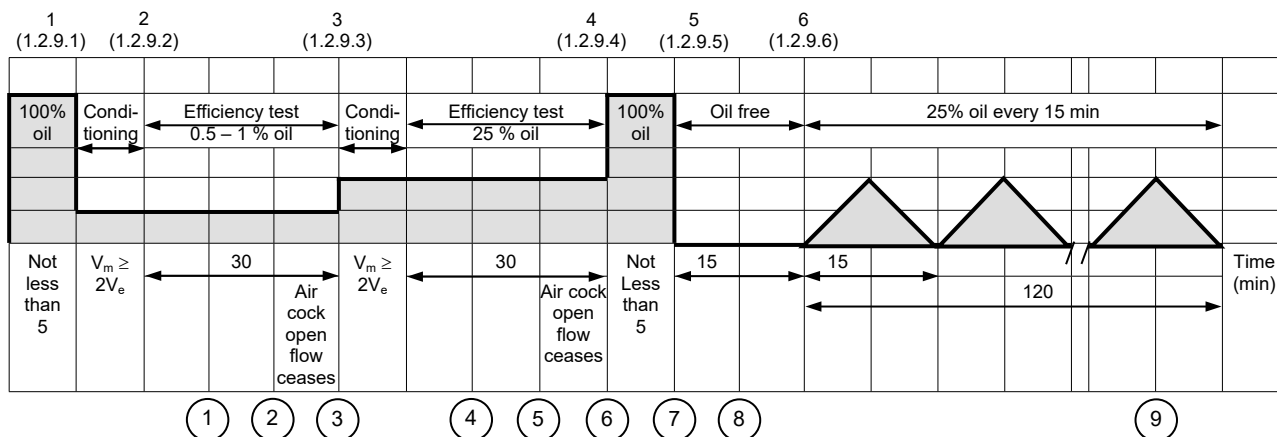
Test fluid "B":

Test fluid "C":

Test water:

TEST RESULTS AND TEST PROCEDURES

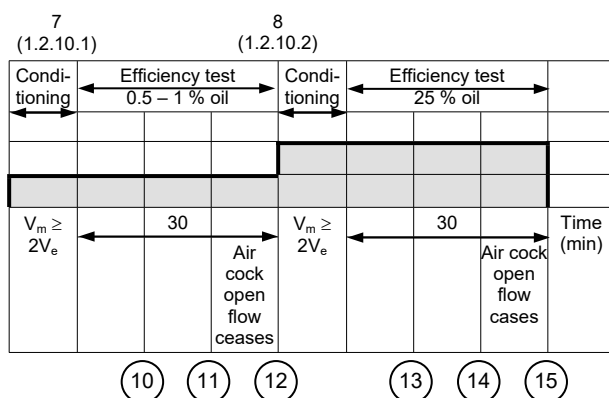
TEST FLUID "A"



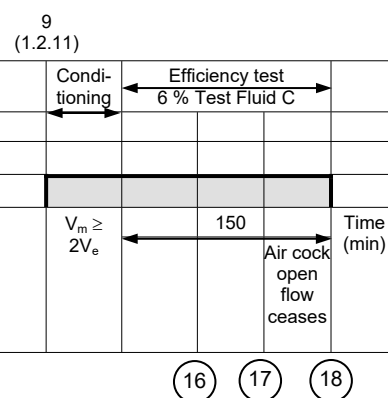
Test sample 9 (taken at the end of auto test, paragraph 1.2.9.6 Annex to resolution MEPC.107(49))

	1	2	3	4	5	6	7	8	9
Influent (%)									
Effluent (ppm)									

TEST FLUID "B"



TEST FLUID "C"



	10	11	12	13	14	15	16	17	18
Influent (%)									
Effluent (ppm)									

V_e - volume of oily water separator (OWS)
V_m - oil/water mixture passed through OWS