DNV·GL

Certificate No:
MEDB000063X

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 Oily Water Separator (for an oil content of the effluent not exceeding 15 p.p.m.)

with type designation(s)
JOWA 3SEP OWS, Type; 0.5 m3/h, 1 m3/h, 2.5 m3/h, 5 m3/h & 10 m3/h

Issued to
Jowa AB
Kållered, Västra Götalands Län, Sweden

is found to comply with the requirements in the following Regulations/Standards:
Regulation **(EU) 2019/1397,**
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 **2024-11-26**.
Issued at **Høvik** on **2019-11-27**

DNV GL local station:
Sweden CMC

Approval Engineer:
Wenjun Wu

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 This certificate remains valid unless suspended, withdrawn, recalled or cancelled.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

NORWEGIAN ACCREDITATION PROD 019

Product description

The JOWA 3SEP Oily Water Separator is intended for installation onboard ships or other marine units for oily bilge water separation to less than 15 ppm at discharge overboard. The equipment is designed and tested to meet the requirements of the IMO Resolution MEPC.107(49).

The 3SEP OWS is a dual stage oily bilge water separation system utilizing differential specific gravity, coalescence plates and filtration to separate and remove free and emulsified oil and monitor the oil residues in the treated water. The equipment is designed for a continuous flow with automatic operation with no use of chemicals.

In the first stage, free oil is to removed by gravity with the help of coalescence plates. An adjustable oil sensor controls the valve for automatic oil release to the sludge tank or any other dedicated tank. In the second stage, emulsified oil is removed in the two filter tanks and the ppm value is monitored by a 15-ppm bilge alarm, before the treated water is discharged overboard. The collected free oil on top of each filter tank is released automatically to the sludge tank at a pre-set interval. When a 15 ppm alarm occurs, the system will automatically close the overboard line and re-circulate the treatable water to the bilge. When the contamination falls below 15 ppm the overboard valve will open again without user intervention.

The Oily Water Separator is designed as a skid assembly with all connection points collected, for easy installation.

Application/Limitation

Applicable models covered in this certificate are listed below :

Model	Max throughput capacity (m^3/h)	Bilge Pump Capacity (m^3/h)
3SEP OWS-0.5	0.5	0.5
3SEP OWS-1	1.0	1.0
3SEP OWS-2.5	2.5	2.5
3SEP OWS-5	5.0	5.0
3SEP OWS-10	10.0	10.0

Applicable to all models	
Working Pressure:	Normal 0 – 2 bar, max. 4 bar
Ambient temperature:	5 - 55 ˚C
Air supply pressure:	4 – 6 bar
Power Supply:	380 – 440 V, 50/60 Hz
Inclination Range:	0 to 22.5 degrees

The following shall be verified during installation:

1. The alarm is always activated whenever clean water is used for cleaning or zeroing purposes;
2. The alarm is always activated whenever no flow of sample through the oil-content meter is detected by the flow sensor;
3. Any alarm will activate the Automatic Stopping Device and lead to recirculation;
4. The overall response time (including the response time of the alarm) between an effluent discharge exceeding 15 ppm oil and to the Automatic Stopping Device preventing the overboard discharge is less than 20 s;
5. By-passing the alarm during normal operation shall by no means be possible.
6. Every access of the alarm (beyond check on instrument drift, repeatability of the instrument reading, and the ability to re-zero the instrument) requires the breaking of a seal.

Limitations

The sampling pipe should be installed in a vertical section of the water effluent piping as close as practicable to the 15ppm Bilge Separator outlet (MEPC.107(49) paragraph 6.1.1). The installation should be in accordance with 24-0000-06-01, 24-0000-03-01 and OWS Sample Point Location as listed in Type Examination Documentation.

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

Type Examination Documentation

Listed drawings/documents refer to each:

Model/ Type:		*Dwg.No.:*	*Date:*	*Title:*
0.5 m^3/h	:	24-0005-01-01	2008-02-14	Arr.mt. drwg. JOWA 3SEP OWS 0.5 m^3/h
		24-0005-01-02	2008-02-14	ISO GA, Connection points, OWS 0.5 m^3/h
		24-0005-01-03	2008-02-14	ISO GA, Parts List, OWS 0.5 m^3/h
1 m^3/h	:	24-0010-01-01	2004-05-06	Arr.mt. drwg. JOWA 3SEP OWS 1 m^3/h
		24-0010-01-02	2004-05-06	Arr.mt. drwg. JOWA 3SEP OWS 1 m^3/h
		24-0010-01-50	2004-09-16	Gravity Separator Tank
		50-0075-01-01	2001-05-16	JOWA Filter & Separator Tank
2.5 m^3/h	:	24-0025-01-01	2004-07-06	Arr.mt. drwg. JOWA 3SEP OWS 2.5 m^3/h
		24-0025-01-02	2004-07-06	Arr.mt. drwg. JOWA 3SEP OWS 2.5 m^3/h
		24-0025-01-50	2004-09-09	Gravity Separator Tank
		50-00150-01-01	2001-06-14	JOWA Filter & Separator Tank
5 m^3/h	:	24-0050-01-01	2004-06-30	Arr.mt. drwg. JOWA 3SEP OWS 5 m^3/h
		24-0050-01-02	2004-06-30	Arr.mt. drwg. JOWA 3SEP OWS 5 m^3/h
		24-0050-01-50	2004-05-24	Gravity Separator Tank
		50-0300-01-01	2001-07-17	JOWA Filter & Separator Tank
10 m^3/h	:	24-0100-01-01	2004-07-12	Arr.mt. drwg. JOWA 3SEP OWS 10 m^3/h
		24-0100-01-01	2004-07-12	Arr.mt. drwg. JOWA 3SEP OWS 10 m^3/h
		24-0100-01-50	2004-07-09	Gravity Separator Tank
		50-0750-01-01	2001-07-26	JOWA Filter & Separator Tank

General drawings/documents for all models:

24-0000-06-01	Rev.5	Recommended installation
24-0000-03-01	Rev.16	P&I Diagram
24-0010-02-01	04.03.29	Component Layout
24-0010-02-02	04.03.29	Main Circuit Diagram
24-0010-02-03	04.03.29	Circuit Diagram
24-0010-02-04	04.03.29	Circuit Diagram
24-0010-02-10	04.03.29	Circuit Diagram – Components List
24-0010-01-03	04.09.17	ISO GA, Parts List (typical)

General system document:

- General System Decription – JOWA 3SEP OWS, dated 2004-07-09.
- Technical data for JOWA 3SEP OWS.
- Test Rig 3SEP OWS, drwg. No. 24-0000-01-10, 2004.08.17.
- OWS Sample Point Location, rev. A, 2020-02-25

Tests carried out

Performance tests

- Test Results and Test Procedures for JOWA 3SEP OWS 1 m^3/h, signed by DNV Gothenburg, 2004-07-13, incl. Certificates of Analysis from AnalyCen, dated 2004-06/-07.
- Test Results and test Procedures for JOWA 3SEP OWS 5 m^3/h, signed by DNV Gothenburg, 2004-09-06, incl. Certificates of Analysis from AnalyCen, dated 2004-08/-09.

Environmental tests

- Semcon AB, Test Report No. 85-036-002/Edt 2, dated 2004-09-03; Vibration and climate test of control cabinet JOWA 3SEP OWS-C1.

Marking of product

The marking shall give 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

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APPENDIX – Performance test results

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

15 ppm Oily Water Separator submitted by:	**Jowa AB, Sweden**
Tested type:	**3SEP OWS-1 and 3SEP OWS-5**
Test location:	**JOWA AB, Tulebo 865, 428 34 Kållered, Sweden**
Date:	**13th July 2004 and 6th September 2004**
Organisation conducting the test:	**AnalyCen, Sweden**
Method of sample analysis:	**ISO 9377-2 mod.**
Test rig according to drawing:	**"Test Rig 3SEP OWS"**
Samples analysed by:	**AnalyCen, Sweden**

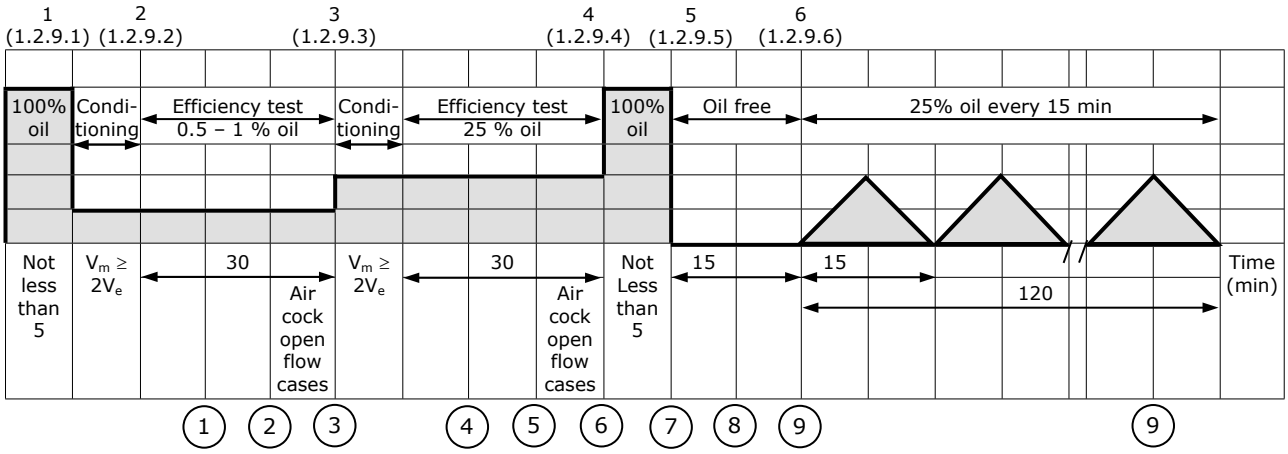
Environmental testing of the electrical and electronic sections of the 15 ppm Oily Water Separator has been carried out in accordance with part 3 of the annex to the guidelines and specifications contained in IMO Resolution MEPC.107(49). The equipment functioned satisfactorily on completion of each test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

Environmental test carried out at **Semcon Sweden AB, Gotaverksgatan 10, 417 55 Goteborg, Sweden**, Test report No: **85-036-002/Edt 2**, issued on **3rd September 2004**.

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

TEST RESULTS (IN PPM) AND TEST PROCEDURES – 3SEP OWS-1

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 (%)	1.0	1.0	1.0	25.0	25.0	25.0	0	0	25.0
Effluent (ppm)	0.15	0.11	0.12	0.28	0.18	0.2	0.055	<0.05	0.054

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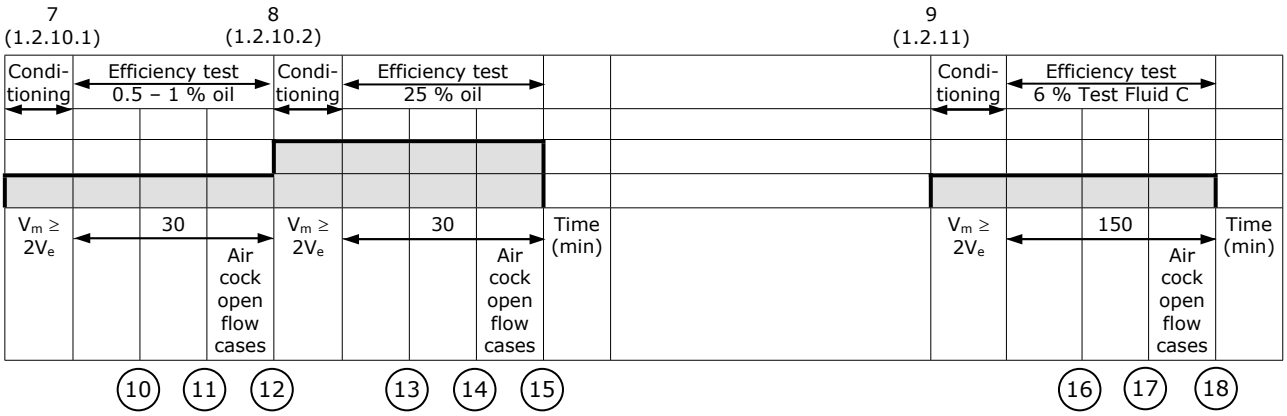
TEST FLUID "B" TEST FLUID "C"



	10	11	12	13	14	15	16	17	18
Influent (%)	0.1	0.1	0.1	25.0	25.0	25.0	0.3	0.3	0.3
Effluent (ppm)	1.1	1.3	1.0	1.1	2.6	3.0	3.9	5.7	5.5

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

Test fluid "A"

Density at 15 °C:	985.7 kg/m^3
Viscosity at 50 °C:	359 mm^2/s
Flashpoint:	73.0 °C
Ash content:	<0.05 %
Water content at start of test:	0.05 %

Test fluid "B"

Density at 15 °C:	850.8 kg/m^3
Viscosity at 40 °C:	3.924 mm^2/s
Flashpoint:	73.0 °C
Ash content:	<0.005 %
Water content at start of test:	60 mg/kg

Test fluid "C"

Surfactant:	Sodium salt of dodecylbenzene sulfonic acid
Iron Oxides:	Fe_3O_4, Cu. 40302

Test water

Density at 20 °C:	1 000.0 kg/m^3
Solid matter present:	No

Test temperatures

Ambient:	20.3 °C
Test fluid "A":	26 °C
Test fluid "B":	16 °C
Test fluid "C":	15 °C
Test water:	18 °C

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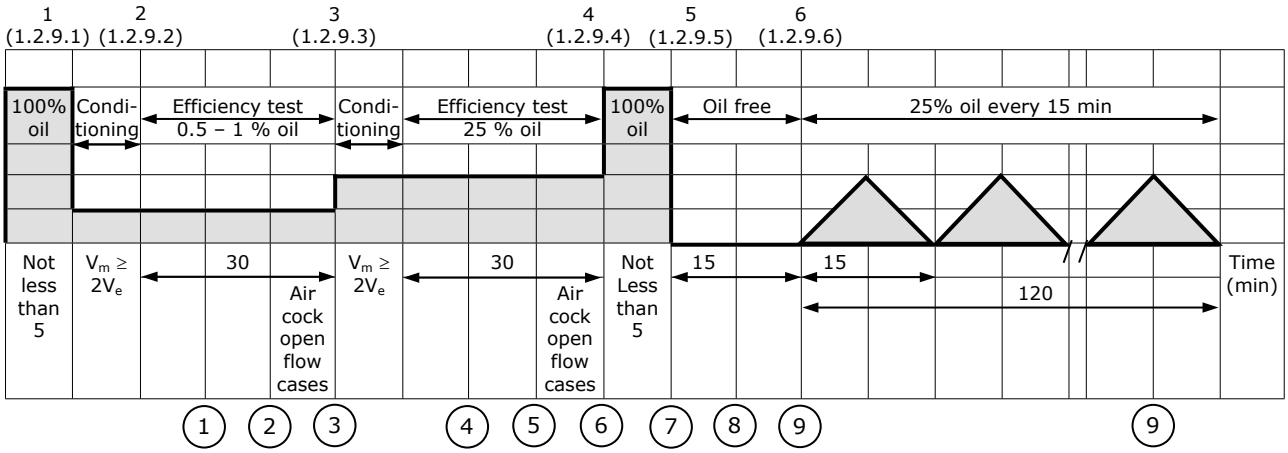
TEST RESULTS (IN PPM) AND TEST PROCEDURES – 3SEP OWS-5

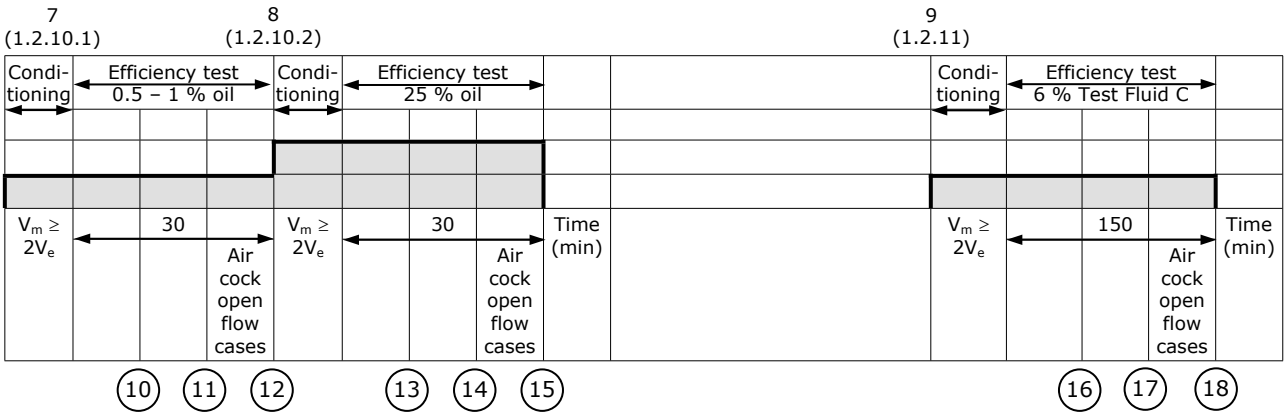
TEST FLUID "A"



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 (%)	1.0	1.0	1.0	25.0	25.0	25.0	0	0	25.0
Effluent (ppm)	<0.1	0.1	0.1	<0.1	0.1	0.	<0.1	0.1	<0.1

TEST FLUID "B" TEST FLUID "C"



	10	11	12	13	14	15	16	17	18
Influent (%)	0.5	0.5	0.5	25.0	25.0	25.0	0.3	0.3	0.3
Effluent (ppm)	0.3	0.25	0.38	0.23	0.39	0.54	0.4	0.7	0.5

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

Test fluid "A"

Density at 15 °C:	987.3 kg/m^3
Viscosity at 50 °C:	377 mm^2/s
Flashpoint:	71.0 °C
Ash content:	<0.05 %
Water content at start of test:	<0.05 %

Test fluid "B"

Density at 15 °C:	850.0 kg/m^3
Viscosity at 40 °C:	3.768 mm^2/s
Flashpoint:	70.0 °C
Ash content:	<0.005 %
Water content at start of test:	50 mg/kg

Test fluid "C"

Surfactant:	Sodium salt of dodecylbenzene sulfonic acid
Iron Oxides:	Fe_3O_4, Cu. 40302

Test water

Density at 20 °C:	1 000.0 kg/m^3
Solid matter present:	No

Test temperatures

Ambient:	20.7 °C
Test fluid "A":	22 °C
Test fluid "B":	20 °C
Test fluid "C":	17 °C
Test water:	19.7 °C