DNV·GL

Certificate No:
TAP0000077

TYPE APPROVAL CERTIFICATE

This is to certify:

That the 5 ppm Bilge Water Separator

with type designation(s)
SDU-0.25, SDU-0.5, SDU-1, SDU-2.5, SDU-5, SDU-7.5, SDU-10

Issued to
Sepflutech GmbH
Hamburg, Germany

is found to comply with
Det Norske Veritas' Type Approval Programme 771.60 5 ppm Bilge Water Separators
Det Norske Veritas' Rules for Classification of Ships

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Type:	Capacity:
SDU-0.25	0.25 m3/h
SDU-0.5	0.50 m3/h
SDU-1	1.00 m3/h
SDU-2.5	2.50 m3/h
SDU-5	5.00 m3/h
SDU-7.5	7.50 m3/h
SDU-10	10.00 m3/h

This Certificate is valid until **2021-01-03**.

Issued at **Høvik** on **2016-01-04**

DNV GL local station: **Høvik Environmental Protection**

for **DNV GL**

Approval Engineer: **Pål Evang Nundal**

Dag Sæle-Nilsen
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

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Product description

The equipment is intended for installation in machinery spaces onboard ships for oily bilge water separation: Maximum 5 ppm at discharge overboard. The 5 ppm bilge separators are designed and tested to meet the requirements of IMO Resolution MEPC.107(49) and DNV TAP 771.60.

The separator adopts three-stage mode: Separation by profile package, filter (5 μm), and coalescer.

Feed pump: Helical rotary pump (eccentric screw pump).

The separator can be delivered with two different control units SCU-V01 or SCU-V02.

SCU-V01
Hardware: PLC: Schneider Electric TM241C24/T, HMI: Schneider Electric HMIS5T
Software: Schulz_1445-03_Deoiler_190115 (03.07.2015 15:22:12)
Firmware: PLC: V4.0.2.11, HMI: V3.5.3.80

SCU-V02
Hardware: Main Board type LBI2914 BWS/Main
Software:V1.11 (dated 08.09.2015)

Application/Limitation

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 5 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:
Installation of the equipment in spaces subject to explosion hazard is not permitted.

A copy of the Operation, installation and maintenance manual shall be on board vessel at all times.

The capacity of the supply pump should not exceed 110% of the rated capacity of the bilge separator

Type Approval documentation

Dwg No.:	*Rev.:*	*Date:*	*Name:*
FD-SDU-025-02-00	0	14.09.2015	Flow diagram, SDU-0,25
FD-SDU-05-02-01	1	22.02.2015	Flow diagram, SDU-0,5
FD-SDU-1-02-00	0	14.09.2015	Flow diagram, SDU-1
FD-SDU-2.5-02-00	0	14.09.2015	Flow diagram, SDU-2,5
FD-SDU-5-02-00	1	22.02.2015	Flow diagram, SDU-5
FD-SDU-7.5-02-00	0	14.09.2015	Flow diagram, SDU-7,5
FD-SDU-10-02-00	0	14.09.2015	Flow diagram, SDU-10
1445-05	0	19.03.2015	Electrical diagram

STO-05-000-00-ROH-GL	0	09.03.2015	Assembly drawing (Through 1st. stage SPO)
SLO-05-000-00-ZB-GL	0	09.03.2015	Coalescer profiles
SDU-05-001-00-ZB-GL	0	09.03.2015	General arrangement
SCO-150-48-500-000-00-ZB-GL	0	09.03.2015	Coalescer element
SPO-025-000-00-ROH-GL	0	02.10.2015	1st stage "SPO", SDU-0.25
SPO-05-001-00-ROH-GL	0	09.03.2015	1st stage "SPO", SDU-0.5
SPO-1-000-00-ROH-GL	0	05.10.2015	1st stage "SPO", SDU-1
SPO-2-5-000-00-ROH-GL	0	05.10.2015	1st stage "SPO", SDU-2.5
SPO-5-000-00-ROH-GL	0	06.10.2015	1st stage "SPO", SDU-5
SPO-7-5-000-00-ROH-GL	0	08.10.2015	1st stage "SPO", SDU-7.5
SPO-10-000-00-ROH-GL	0	07.10.2015	1st stage "SPO", SDU-10
SFU-51-1-20/30-000-00-ZB-GL	0	03.08.2015	Filter stage "SFU", SDU-0.25
SFU-51-1-30-000-00-ZB-GL	0	09.03.2015	Filter stage "SFU", SDU-0.5
SFU-6-3_6-20_40-000-00-ZB-GL	0	20.07.2015	Filter stage "SFU", SDU-1
SFU-6-3_6-20_40-000-00-ZB-GL	0	20.07.2015	Filter stage "SFU", SDU-2.5
SFU-6-3_6-20_40-000-00-ZB-GL	0	20.07.2015	Filter stage "SFU", SDU-5
SFU-6-3_6-20_40-000-00-ZB-GL	0	20.07.2015	Filter stage "SFU", SDU-7.5
SFU-6-3_6-20_40-000-00-ZB-G	0	20.07.2015	Filter stage "SFU", SDU-10
SCO-025-000-00-ROH-GL	0	02.10.2015	2nd stage "SCO", SDU-0.25
SCO-05-001-00-ROH-GL	0	09.03.2015	2nd stage "SCO", SDU-0.5
SCO-1-000-00-ROH-GL	0	05.10.2015	2nd stage "SCO", SDU-1
SCO-2-5-000-00-ROH-GL	0	06.10.2015	2nd stage "SCO", SDU-2.5
SCO-5-000-00-ROH-GL	0	06.10.2015	2nd stage "SCO", SDU-5
SCO-7-5-000-00-ROH-GL	0	08.10.2015	2nd stage "SCO", SDU-7.5
SCO-10-000-00-ROH-GL	0	08.10.2015	2nd stage "SCO", SDU-10

Tests carried out

Performance test of SDU-7.5:
Pella Sietas GmbH, Test report No.: 90491532301-7.5, dated 2015-09-22, witnessed by DNV GL

Environmental test of SCU-V01:
TREO, Tempowerking, Test report No.: 081-15, issued at TREO on 2015-07-13

Performance test of SDU-0.5:
Sepflutech GmbH, Test report No.: 90491532301-0.5, dated 2015-02-25, witnessed by DNV GL

Environmental test of SCU-V02:
TREO, Tempowerking, Test report No.: 082-15, issued at TREO on 2015-06-30

Marking of product

For traceability to this certificate, each unit to be marked with:

– 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

Periodical assessment

DNV GL's surveyor is to be given permission to perform Periodical Assessments at any time during the validity of this certificate and at least every second year. The arrangement is to be in accordance with procedure described in Standard for certification No. 1.2 Type Approval Item 4

Appendix

TEST DATA AND RESULTS OF TESTS CONDUCTED ON A 5 PPM BILGE SEPARATOR IN ACCORDANCE WITH PART 1 OF THE ANNEX TO THE GUIDELINES AND SPECIFICATIONS CONTAINED IN IMO RESOLUTION MEPC.107(49) and DNV GL TAP 771.

5 ppm Bilge Separator submitted by Sepflutech GmbH, Poppenbütteler Bogen 84, D-22399 Hamburg.

Test location SDU-0,5: Sepflutech GmbH, Poppenbütteler Bogen 84, D-22399 Hamburg

Test location SDU-7,5 Pella Sietas GmbH, 21129 Hamburg, Germany

Method of sample analysis: ISO 9377-2:2000

Samples analysed by GBA Laborgruppe mbH, Flensburger Strasse 15, 25421 Pinneberg, Germany

Environmental testing of the electrical and electronic sections of the 5 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.

Performance test of SDU-0,5:

Test fluid "A"

Density	990	kg/m^3 at 15ºC
Viscosity	35	Centistokes at 100ºC
Flashpoint	>65	ºC
Ash content	<0.1	%
Water content at start of test	0.1	%

Test fluid "B"

Density	880	kg/m^3 at 15ºC
Viscosity	6.5	Centistokes at 40ºC
Flashpoint	>65	ºC
Ash content	<0.1	%
Water content at start of test	0.01	%

Test fluid "C"

Surfactant	Sigma-Aldrich Chemie GmbH, Prod. No.: 289957, Debecylbenzenesulfonic Acid Sodium Salt
Iron oxides	KSL Staubtechnik, CAS No.: 1317-61-9, Magnite Fe3O4

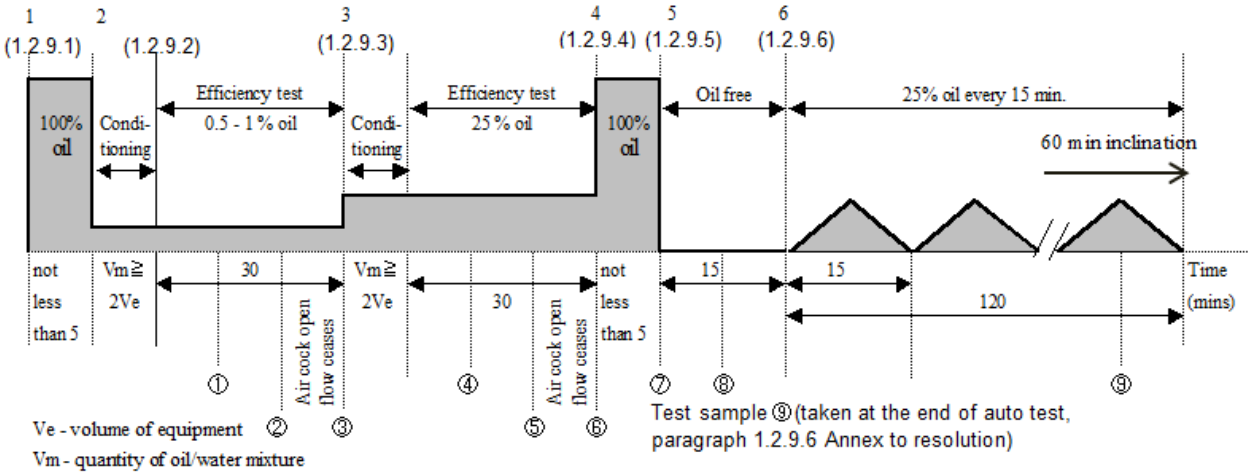
Test water

Density	1004	kg/m^3 at 20 ºC
Solid matters present	6700	%

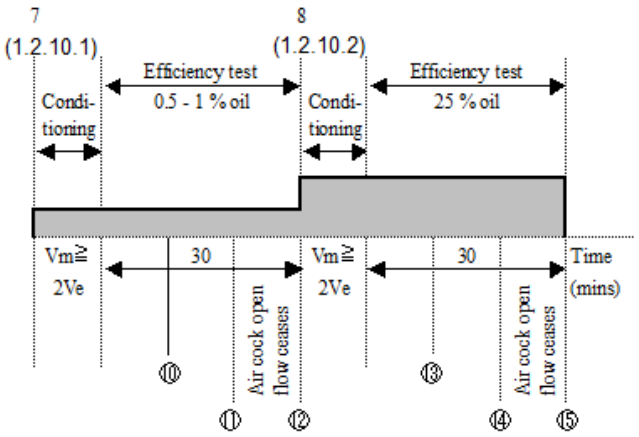
Test temperatures

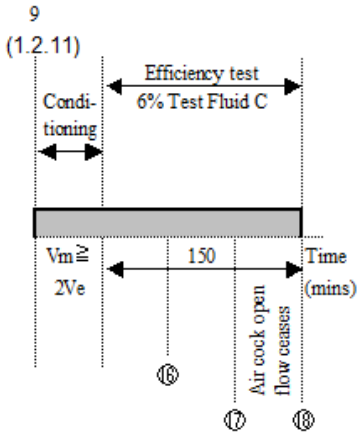
Ambient	22	ºC
Test fluid "A"	34	ºC
Test fluid "B"	19	ºC
Test fluid "C"	17	ºC
Test water	24	ºC

Test results and test procedure



	1	2	3	4	5	6	7	8	9
Influent	0.5-1	0.5-1	0.5-1	25	25	25	0	0	25
Effluent	0.14	0.28	0.17	<0.10	<0.10	<0.10	0.16	0.10	<0.10





1 – 9 steps refer to paragraph

① - ⑱ points where samples to be taken

	10	11	12	13	14	15
Influent	0.5-1	0.5-1	0.5-1	25	25	25
Effluent	<0.10	<0.10	<0.10	<0.10	0.36	0.10

16	17	18
6	6	6
0.53	0.45	0.63

Performance test of SDU-7,5:

Test fluid "A"

Density	990	kg/m^3 at 15ºC
Viscosity	35	Centistokes at 100ºC
Flashpoint	>80	ºC
Ash content	<0.1	%
Water content at start of test	0.1	%

Test fluid "B"

Density	880	kg/m^3 at 15ºC
Viscosity	6.5	Centistokes at 40ºC
Flashpoint	>65	ºC
Ash content	<0.1	%
Water content at start of test	0.01	%

Test fluid "C"

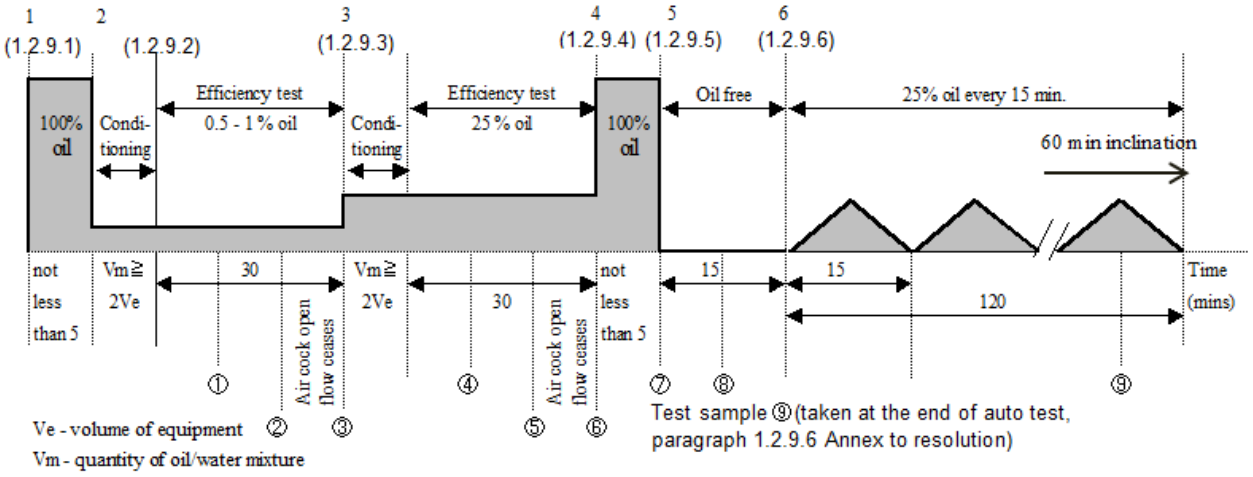
Surfactant	Sigma-Aldrich Chemie GmbH, Prod. No.: 289957, Debecylbenzenesulfonic Acid Sodium Salt
Iron oxides	KSL Staubtechnik, CAS No.: 1317-61-9, Magnite Fe3O4

Test water

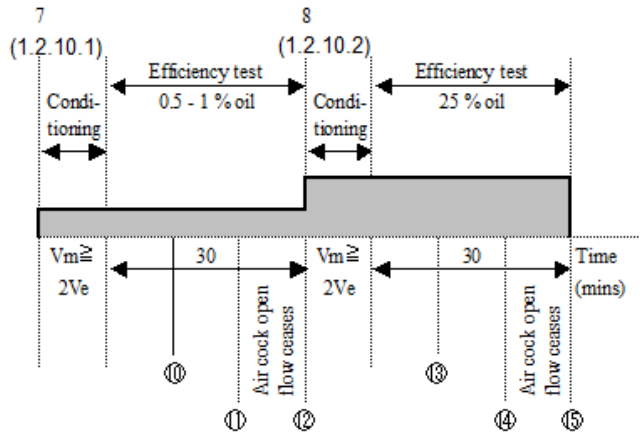
Density	1000	kg/m^3 at 20 ºC
Solid matters present	6700	%

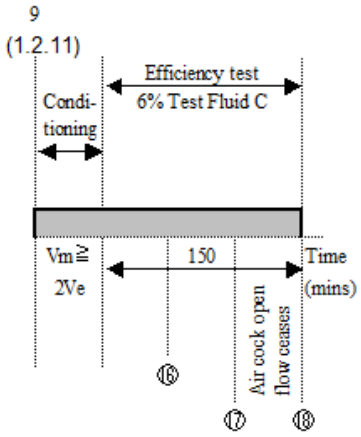
Test temperatures

Ambient	14.7	ºC
Test fluid "A"	27.2	ºC
Test fluid "B"	14.2	ºC
Test fluid "C"	18.4	ºC
Test water	16.0	ºC



	1	2	3	4	5	6	7	8	9
Influent	0.5-1	0.5-1	0.5-1	25	25	25	0	0	25
Effluent	<0.10	<0.10	<0.10	<0.10	<0.10	<0.12	<0.10	0.18	0.17





1 – 9 steps refer to paragraph in appendix A2 of DNV TAP 771.60

① - ⑱ points where samples to be taken

	10	11	12	13	14	15
Influent	0.5-1	0.5-1	0.5-1	25	25	25
Effluent	<0.10	0.19	<0.10	0.31	0.34	0.40

16	17	18
6	6	6
2.90	4.20	4.20