DNV·GL

Certificate No:
TAP00001X1

TYPE APPROVAL CERTIFICATE

This is to certify:

That the 5 ppm Bilge Water Separator

with type designation(s)
SBC250S, SBC500S

Issued to
Samgong Co., Ltd.
Busan, Republic of Korea

is found to comply with
DNV GL class programme DNVGL-CP-0208 – Type approval – 5 ppm bilge water separators

Application :

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

Type:	**Capacity:**
SBC250S	**2.5 m3/hr**
SBC500S	**5.0 m3/hr**

Issued at **Høvik** on **2020-12-15**
This Certificate is valid until **2025-12-07**.
DNV GL local station: **Gimhae Station**

Approval Engineer: **Thomas Grafton**

for **DNV GL**

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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") 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.

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Product description

The SBCxxxS Series of bilge water separators are intended for installation onboard ships or other marine units to reduce the oil content in the bilge water to less than 5 ppm. The equipment is designed and tested to meet the requirements of DNVGL-CP-0208.

The SBCxxxS Series uses a high-speed centrifuge to separate oil from bilge water. The treatment processes follows the following stages: (i) Pre-treatment stage where the bilge water is fed through a strainer to separate any large foreign particles; (ii) Heating stage where the bilge water is fed through a steam heater to raise the temperature to the operating temperature; (iii) Treatment stage where the bilge water is fed through a high-speed centrifuge. Separated oil and water leave the centrifuge unit through each outlet and sludges that accumulate at the periphery are discharged periodically to the sludge tank; (iv) Additional filtration stage where the separated water that leaves the centrifuge is passed through a membrane filter ("Polishing" filter).

Application/Limitation

Application:

Model:	***Max. Flowrate (m^3/h)***	***Supply Pump Capacity (*) (m^3/h)***	***Supply Pump Type***	***Supply Pump Motor Rating (*)***
SBC250S	2.5	2.5	Nova Rotors Diamond Series DN4L1	1.65 kW @ 183 rpm
SBC500S	5.0	5.0	Nova Rotors Diamond Series DN4L1	1.65 kW @ 345 rpm

Applicable to all Models (unless specified otherwise)	
Operating Pressure:	Max. 3 bar
Operating Temperature of Bilge Water:	30 - 50 °C A steam heater is fitted to all models that further heats the bilge water to 70 – 90 °C
Power Supply:	440 V / 60 Hz, 3-phase
Inclination Range:	0 to 22.5 degrees

(*) The SBCxxxS Series are fitted with an integral electric cavity pump. The pumping capacity is set to the correct value through the power setting of the motor.

Limitations

The SBCxxxS series are fitted with a 5ppm Oil Content Monitor required by the DNV GL optional Class Notation **Clean(Design)**. The 5ppm Oil Content Monitor shall be provided with separate Type Approval Certificates (to standard DNVGL-CP-0485).

The 5 ppm separator shall be fitted with a heating facility.

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

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

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

Installation:

The following shall be verified after installation: -

1. An alarm in the 5ppm Oil Content Monitor is always activated whenever clean water is used for cleaning or zeroing purposes.
2. An alarm in the 5ppm Oil Content Monitor is always activated whenever no flow of sample through the oil content monitor is detected by the flow sensor
3. Any alarm in the 5ppm Oil Content Monitor will activate the automatic stopping device preventing overboard discharge and lead to recirculation
4. The overall response time (including the response time of the 5 ppm Bilge Monitor) between an effluent discharge from the 5 ppm Bilge Separator exceeding 5 ppm, and the operation of the Automatic Stopping Device preventing overboard discharge, shall be not more than 20 seconds.
5. Every access of the alarm (beyond check on instrument drift, repeatability of the instrument reading, and the ability to re-zero the instrument) requires breaking of a seal.

Type Approval documentation

Flow Diagrams:

Drawing Title	*Drawing Number*	*Revision*
Flow Diagram for Bilge Separator Unit (SBC250S)	SBGSU001-5P	0 (17.05.2019)
Flow Diagram for Bilge Separator Unit (SBC500S)	SBGSU002-5P	0 (26.04.2019)

Assembly Diagrams:

Drawing Title	*Drawing Number*	*Revision*
Outline Drawing for Bilge Separator Unit (SBC250S)	SGBSU001-5P	0 (15.05.2019)
Outline Drawing for Bilge Separator Unit (SBC500S)	SGBSU002-5P	0 (26.04.2019)
General Three View (SBC250S)	SGBOD001	0 (05.07.2019)
General Three View (SBC500S)	SGBOD002	0 (10.04.2019)
Sectional Drawing (SBC250S)	SGBSD001	0 (05.07.2019)
Sectional Drawing (SBC500S)	SGBSD002	0 (10.04.2019)
Bowl Sectional Drawing (SBC250S)	S255490	0 (05.07.2019)
Bowl Sectional Drawing (SBC500S)	S255491	0 (10.04.2019)
Disc for Bowl (SBC250S)	S255490-1	0 (05.07.2019)
Disc for Bowl (SBC500S)	S255491-1	0 (10.04.2019)
Top Disc for Bowl (SBC250S)	S255490-2	0 (05.07.2019)
Top Disc for Bowl (SBC500S)	S255491-2	0 (10.04.2019)
Bowl Nut for Bowl (SBC250S)	S255490-3	0 (10.04.2019)
Bowl Nut for Bowl (SBC250S)	S255491-3	0 (10.04.2019)
Water Chamber for Bowl Ring (SBC250S)	S255490-4	0 (05.07.2019)
Water Chamber for Bowl Ring (SBC500S)	S255491-4	0 (10.04.2019)
Main Cylinder for Bowl (SBC250S)	S255490-5	0 (05.07.2019)
Main Cylinder for Bowl (SBC500S)	S255491-5	0 (10.04.2019)
Pilot Ring for Bowl (SBC250S)	S255490-6	0 (05.07.2019)
Pilot Ring for Bowl (SBC500S)	S255491-6	0 (10.04.2019)
Bowl Body for Bowl (SC250S)	S255490-7	0 (05.07.2019)
Bowl Body for Bowl (SC500S)	S255491-7	0 (10.04.2019)
Water Supply Chamber for Bowl (SBC250S)	S255490-8	0 (05.07.2019)
Water Supply Chamber for Bowl (SBC500S)	S255491-8	0 (05.07.2019)
Heavy Liquid Chamber for Bowl (SBC250S)	S255490-9	0 (05.07.2019)
Heavy Liquid Chamber for Bowl (SBC500S)	S255491-9	0 (10.04.2019)
Heavy Liquid Impeller for Bowl (SBC250S)	S255490-10	0 (05.07.2019)
Heavy Liquid Impeller for Bowl (SBC500S)	S255491-10	0 (10.04.2019)
Inlet Pipe for Bowl (SBC250S)	S255490-11	0 (05.07.2019)

Inlet Pipe for Bowl (SBC500S)	S255491-11	0 (10.04.2019)
Light Liquid Chamber for Bowl (SBC250S)	S255490-12	0 (05.07.2019)
Light Liquid Chamber for Bowl (SBC500S)	S255491-12	0 (10.04.2019)
Light Liquid Impeller for Bowl (SBC250S)	S255490-13	0 (05.07.2019)
Light Liquid Impeller for Bowl (SBC250S)	S255491-13	0 (10.04.2019)
Distributor for Bowl (SBC250S)	S255490-14	0 (05.07.2019)
Distributor for Bowl (SBC500S)	S255491-14	0 (10.04.2019)
Bowl Hood for Bowl (SBC250S)	S255490-15	0 (05.07.2019)
Bowl Hood for Bowl (SBC500S)	S255491-15	0 (10.04.2019)
Gravity Disc for Bowl (SBC250S)	S255490-16	0 (05.07.2019)
Gravity Disc for Bowl (SBC500S)	S255491-16	0 (10.04.2019)
Vertical Shaft Ass'y (SBC250S)	SGVHA001	0 (05.07.2019)
Vertical Shaft Ass'y (SBC500S)	SGVHA002	0 (10.04.2019)
Horizontal Shaft Ass'y (SBC250S)	SGHSA001	0 (05.07.2019)
Horizontal Shaft Ass'y (SBC500S)	SGHSA002	0 (10.04.2019)
Induction Motor for Separator (SBC250S)	SGIM001	0 (05.07.2019)
Induction Motor for Separator (SBC500S)	SGIM002	0 (10.04.2019)
Name Plate (SBC250S)	SGNP001	0 (05.07.2019)
Name Plate (SBC500S)	SGNP002	0 (10.04.2019)
Safety Sticker (SBC250S)	SGBST001	0 (05.07.2019)
Safety Sticker (SBC500S)	SGBST002	0 (10.04.2019)
Safety Sticker 2 (SBC250S)	SGBST003	0 (05.07.2019)
Safety Sticker 2 (SBC500S)	SGBST004	0 (10.04.2019)
Polishing Filter Unit (SBC250S)	SGPF003	1 (31.03.2020)
Polishing Filter Unit (SBC500S)	SGPF004	1 (31.03.2020)
Steam Heater (SBC250S)	SGBH001	0 (05.07.2019)
Steam Heater (SBC500S)	SGBH002	0 (10.04.2019)
3-way Cylinder Valve (SBC250S)	SGHCV001	0 (05.07.2019)
3-way Cylinder Valve (SBC500S)	SGHCV002	0 (05.07.2019)
Temperature Control Valve (SBC250S)	SGTCV001	0 (05.07.2019)
Temperature Control Valve (SBC250S)	SGTCV002	0 (10.04.2019)
Steam Trap (SBC250S)	SGHCV001	0 (05.07.2019)
Steam Trap (SBC500S)	SGHCV002	0 (10.04.2019)
Level Switch for Sludge Tank (SBC250S)	SGLS001	0 (05.07.2019)
Level Switch for Sludge Tank (SBC500S)	SGLS002	0 (10.04.2019)
Sludge Tank (SBC250S)	SGBST001	0 (05.07.2019)
Sludge Tank (SBC250S)	SGBST002	0 (10.04.2019)
Temperature Transmitter (SBC250S)	SGTT001	0 (05.07.2019)
Temperature Transmitter (SBC500S)	SGTT002	0 (10.04.2019)
Pan Check Valve (SBC250S)	SGPCV001	0 (05.07.2019)
Pan Check Valve (SBC500S)	SGPCV002	0 (10.04.2019)
Sampling Cock (SBC250S)	SGSPC001	0 (05.07.2019)
Sampling Cock (SBC500S)	SGSPC002	0 (10.04.2019)

Supply Pump:

Drawing Title	*Drawing Number*	*Revision*
Mono Pump Specification Sheet (SBC250S)	-	-
Mono Pump Specification Sheet (SBC500S)	-	-
Nova Rotors Srl Performance Curve Diamond Series 4L1	PDA001	(04.12.2015)
Nova Rotors Srl Processing Cavity Pumps: Dimensional Drawing	DN041BNR015	00 (29.03.2017)
Motive Srl DELPHI 90L-4 / kW 1.5 / Hz 60 260/440V/ /B5/	-	(10.04.2017)
Motive Srl Data-sheet 90L-4, Stnadard, 4 poles, B5	-	(10.04.2017)

Electrical Drawings:

Drawing Title	*Drawing Number*	*Revision*
Drawing Cover (SBC250S)	SGBPPL001-5P	0 (05.07.2019)
Drawing Cover (SBC500S)	SGBPPL001-1-5P	0 (10.04.2019)
Parts List (SBC250S)	SGBPPL002-5P	0 (14.08.2019)
Parts List (SBC550S)	SGBPPL002-1-5P	0 (14.08.2019)
Outline Drawing (SBC500S)	SGOP001-5P	0 (03.05.2019)
Outline Drawing (SBC250S)	SGOP001-1-5P	0 (03.05.2019)
Schematic Diagram (SBC250S)	SGBPSD001-5P	0 (03.05.2019)
Schematic Diagram (SBC500S)	SGBPSD001-1-5P	0 (03.05.2019)
Wiring Diagram (SBC250S)	SGBPWD001-5P	0 (05.07.2019)
Wiring Diagram (SBC500S)	SGBPWD001-1-5P	0 (05.07.2019)

Operation and Maintenance Manuals:

Drawing Title	*Drawing Number*	*Revision*
Samgong BilgeCare Instruction Manual, Bilge Separator SBC250S/500S	Q180515-00	-

Tests carried out

Performance Tests:

- DNVGL 5 ppm Bilge Water Separator Type Approval Test, Model: SBC250S (Fluid A only) (witnessed by DNV GL), R-2011-002 dated 7 December 2020.
- DNVGL 5 ppm Bilge Water Separator Type Approval Test, Model: SBC500S (Fluid A and Fluid B) (witnessed by DNV GL), R-2011-001 dated 7 December 2020.
- Certificate of Performance Test (IMO Testing), Model: SBC250 (witnessed by Korean Register), Report No. GCHKM-0001-17, dated 13.01.2017.
- Certificate of Performance Test (IMO Testing), Model: SBC500 (witnessed by Korean Register), Report No. GCHKM-0001-19, dated 13.01.2017.

Environmental Tests:

- Environmental Test Report: Samgong SBC250S/SBC500S Bilge Separator Control Panel, Report KOMERI-0602-19T4175 Rev.1 dated 12.12.2019. (Vibration and inclination testing.)
- Environmental Test Report: Samgong SBC250S/SBC500S Bilge Separator Control Panel, Report KOMERI-0314-19T4174 Rev.1 dated 11.12.2019. (Temperature and humidity testing.)

Other Tests/Reports:

- Test Report for Alarm & Function of Separator and Automatic Stopping Device (Witnessed by DNVGL), report R-2001-005 dated 20.01.2020.
- Technical Deviations List, IMO MEPC.107(49) and DNVGL-CP-0208, 5ppm Bilge Separator, Samgong Co.Ltd, dated 27.10.2019.

Marking of product

The final product shall be provided with visible marking, which completely identifies the product and its components according to drawings/equipment specifications.

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.

Periodical assessment

Retention survey to be performed according to Type approval program DNVGL-CP-0338:

This certificate is valid for five years and periodical assessments will be required after 2 years (+/- 90 days) and 3.5 years (+/- 90 days). The date defining the beginning of as the validity period is 15.12.2020.

APPENDIX – SBC250S

Test data and results of tests conducted on a 5 ppm Bilge Separator in accordance with DNVGL-CP-0208.

5 ppm Bilge Separator submitted by:

Tested type:

Test location:

Date:

Organisation conducting the test:

Method of sample analysis:

Test rig according to drawing:

Samples analysed by:

Environmental testing of the electrical and electronic sections of the 5 ppm Bilge Separator has been carried out in accordance with Appendix B of DNVGL-CP-0208. The equipment functioned satisfactorily on completion of each test specified on the environmental test protocol.

Environmental test carried out at **Korea Marine Equipment Research Institute, 35, Mieumsandan 5-ro, Gangseo-gu, Busan, 46744, Korea**,Test report No:**KOMERI-0314-19T4174 Rev.1 and KOMERI-0602-19T4175 Rev.1**, issued at **Busan, Rep. of Korea** on **11.12.2019 and 12.12.2019**.

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:

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Iron Oxides:

Test water

Density at 20 °C:

Solid matter present:

Test temperature

Ambient:

Test fluid "A":

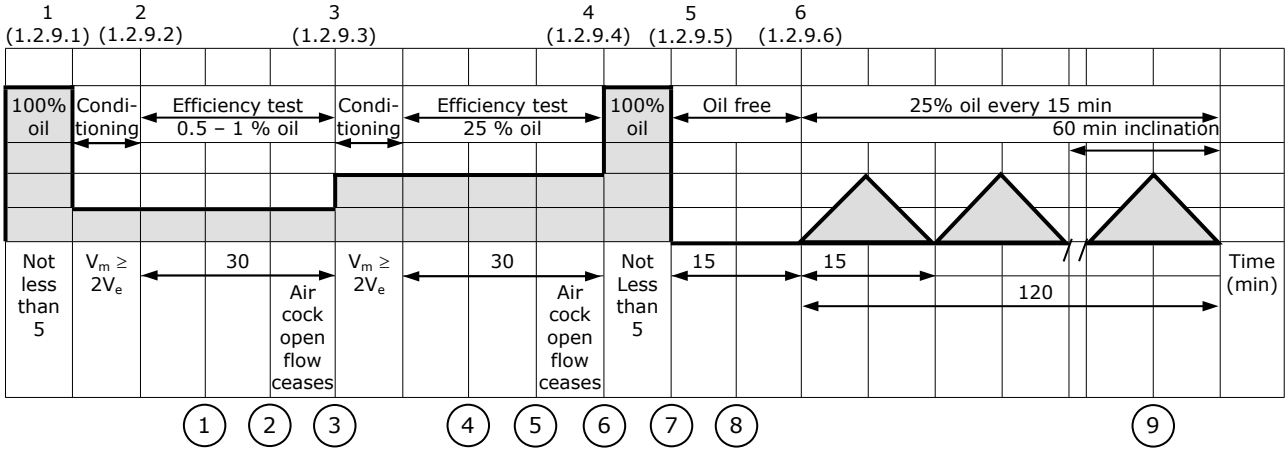
Test fluid "B":

Test fluid "C":

Test water:

TEST RESULTS AND TEST PROCEDURES

TEST FLUID "A" **(*)**

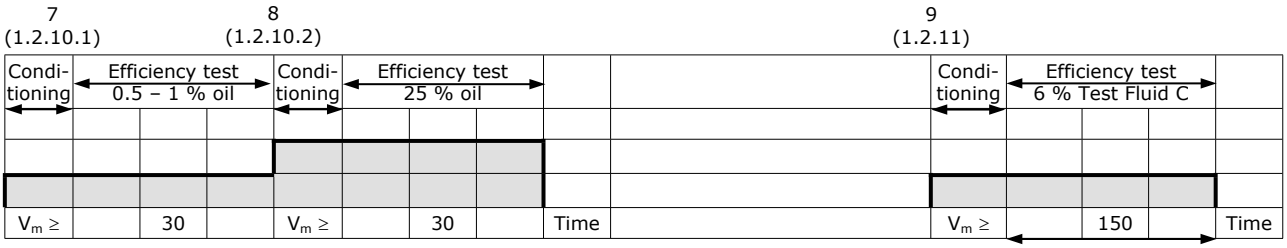


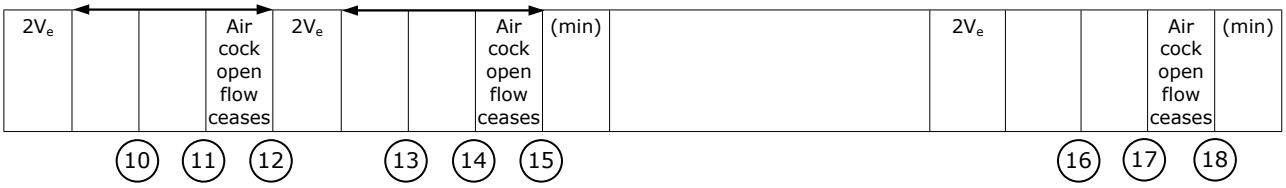
Test sample 9 (taken at the end of auto test, paragraph 2.9 item (6) in Appendix A of DNVGL-CP-0208)

	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 – SBC500S

Test data and results of tests conducted on a 5 ppm Bilge Separator in accordance with DNVGL-CP-0208.

5 ppm Bilge Separator submitted by:

Tested type:

Test location:

Date:

Organisation conducting the test:

Method of sample analysis:

Test rig according to drawing:

Samples analysed by:

Environmental testing of the electrical and electronic sections of the 5 ppm Bilge Separator has been carried out in accordance with Appendix B of DNVGL-CP-0208. The equipment functioned satisfactorily on completion of each test specified on the environmental test protocol.

Environmental test carried out at **Korea Marine Equipment Research Institute, 35, Mieumsandan 5-ro, Gangseo-gu, Busan, 46744, Korea**,Test report No:**KOMERI-0314-19T4174 Rev.1 and KOMERI-0602-19T4175 Rev.1**, issued at **Busan, Rep. of Korea** on **11.12.2019 and 12.12.2019**.

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":

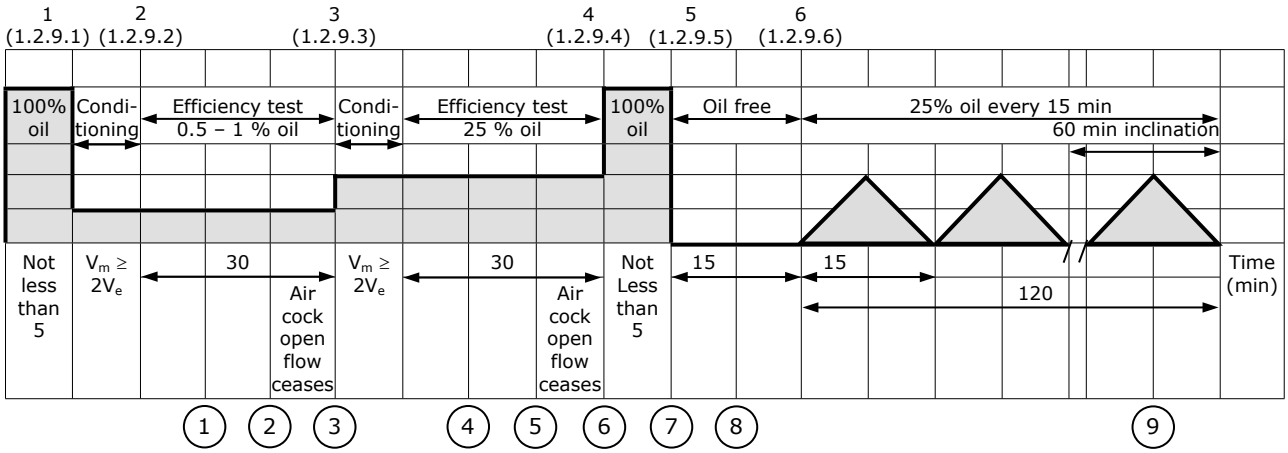
Test fluid "B":

Test fluid "C":

Test water:

TEST RESULTS AND TEST PROCEDURES

TEST FLUID "A" **(*)**

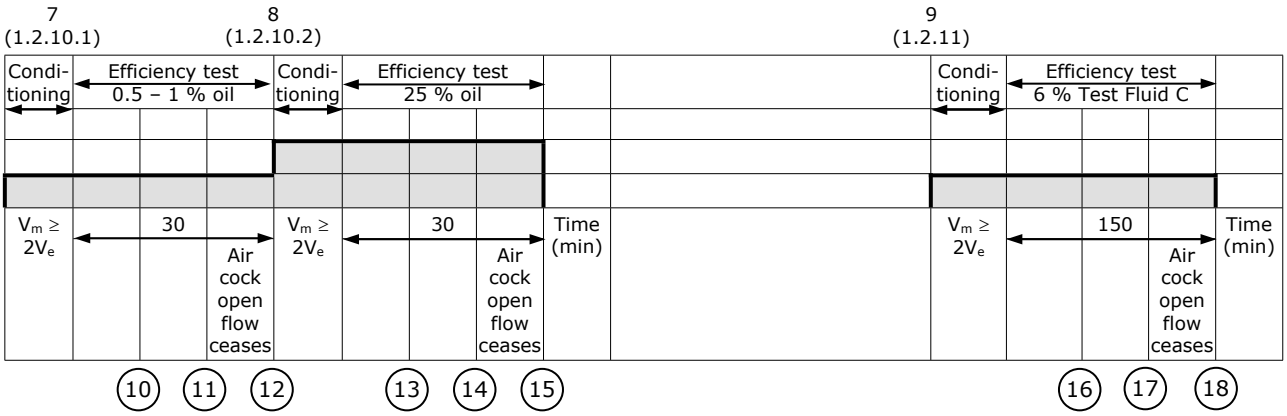


Test sample 9 (taken at the end of auto test, paragraph 2.9 item (6) in Appendix A of DNVGL-CP-0208)

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

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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