DNV·GL

Certificate No:
MEDB0000724

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 Oil discharge monitoring and control system for an oil tanker

with type designation(s)
JOWA ODME 2005

Issued to
Jowa AB
Kallered, Sweden

is found to comply with the requirements in the following Regulations/Standards:
Regulation **(EU) 2020/1170,**
item No. MED/2.5. Marpol 73/78 as amended, Annex I Regulation 31, IMO Res. MEPC.108(49) as amended and IMO MEPC.1/Circ.858

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

This Certificate is valid until **2025-10-13**.
Issued at **Hamburg** on **2020-10-14**

DNV GL local station:
Sweden CMC

Approval Engineer:
Hagen Markus

Notified Body
No.: **0098**

for **DNV GL SE**

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 This certificate remains valid unless suspended, withdrawn, recalled or cancelled.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

Oil Discharge Monitoring and Control System for an Oil Tanker

Assembly drawings

JOWA ODME 2005 Assembly drawing Zener & Solenoid Unit, Analysing Unit, ODME Computer Unit, Terminal Box, Measuring Unit	88-0000-01-01, Rev#8 072029ES
JOWA ODME 2005 Sample conditioning unit	88-0093-01-01, 2010-11-25

Analysing system - main components

Component	Drawing	EC Type Examination Certificate	IECex
Terminal Box	88093-00010	SIRA 05ATEX2171	SIR13.0161
Measuring Unit	88093-00010	SIRA 05ATEX2170	SIR13.0160
Zener / Solenoid Unit	88-0094-01-01	SIRA 05ATEX2172	SIR13.0162

Computer unit	88-0096-01-01
Software Computer	Version 1.2.xx[1]
Software Smart Cell	Version 1.3.xx[1]

Note
[1] In case of major software changes version to be changed to 1.3, 1.4 respectively, requires verification by notified body.

Sample conditioning unit main – components

Component	Manufacturer/ Standard	Type[1]	EC Type Examination Certificate
Sample feed pump Walter	Walter Speck	Y 2951.0142	n.a.
Electric motor		ATB/E.Y63	PTB 00 ATEX 3373
Pneumatic motor	GAST	NL 22	n.a.
Pressure transmitter	tecsis GmbH	E11/12/13	DMT02ATEXE114X
	Ellison SENSORS	GS4200EX0016AB	TRAC12ATEX0060X
	Siemens	SITRANS P200, P210, P220	SEV 10 ATEX 0146

Note
[1] Component types equivalent to the above are included

Application/Limitation

The oil discharge monitoring and control system for oil tankers of type JOWA ODME 2005 is type approved for monitoring the discharge of oil contaminated water from cargo tank areas of oil tankers. Scope approved acc. to Part 1 of the Annex to the Guidelines and Specifications contained in the IMO Resolution MEPC.108(49), as amended by Resolution MEPC.240(65).

Crude oils	"Black" and "White" products	
Biofuel blends		
75% Petroleum Oil	Diesel Oil 75%,	25% Fatty acid methyl ester
	Diesel Oil 75%,	25% Vegetable oil
	Petrol 75%,	25% Ethanol
	Diesel Oil 75%,	25% Alkanes(C10-C26) linear and branched, FP>60°C
99% Petroleum Oil	Diesel Oil 99%,	1% Fatty acid methyl ester
	Diesel Oil 99%,	1% Alkanes(C10-C26) linear and branched, FP>60°C
	Diesel Oil 99%,	1% Vegetable oil
	Petrol 99%,	1% Ethanol

Type Examination documentation

Tests carried out

Marking of product

For traceability to this EC Type-Examination, each unit to be marked with;

Scope	Example
Manufacturer name	JOWA AB
Product type	JOWA ODME 2005
MED Mark of conformity according to Article 10 of the Council Directive (MED)[1]	0098 /2020
Serial number	xxxxxxxxxxxxxxxxxx

Note
[1] may only be affixed to the type approved equipment, if the associated production surveillance module (D, E or F) is valid.

This certificate replaces previous MED Module B certificate 12 024-10HH.

APPENDIX

Test Data and Results of Tests conducted on an Oil discharge monitoring and control system in accordance with Part 1 of the Annex to the Guidelines and Specifications Contained in IMO Resolution MEPC.108(49), as amended by Resolution MEPC.240(65).

Oil discharge monitoring and control system submitted by	JOWA AB
Test location	Redhill, Surrey, RH14DP, UK
Test dates	Initial type tests: 5th May 2005
	Biofuel oil tests: 23rd November 2016
Test rig according to drawing	DEV 709
Method of sample analysis	ISO 9377-2: 2000, ISO 9377-2.1 (Modified by OSPAR)
Samples analysed by	1.Tei-Testing Services, Salt Lake City, USA Report No. TS-A-01954 and TS-A-02157
	2.SGS Oil Gas & Chemicals, Great Yarmouth, UK Report no. GY15-00238_..10021, GY15-00238_..10023, GY15-00306_..10190
	3.GBA Gesellschaft für Bioanalytik, Pinneberg, Germany Report no. 2016P500382 / 1, 2016P500383 / 1

Environmental testing of the electronic section of the oil discharge monitoring and control system has been carried out in accordance with part 2 of the annex to the guidelines and specifications contained in IMO Resolution MEPC.108(49), as amended by Resolution MEPC.240(65). The equipment functioned satisfactorily on completion of each test specified on the environmental test protocol.

Test were carried out at Intertek ETL SEMKO, Test report No.: 05017308, 05017205, issued at Leatherhead, UK in June 2005.

Remarks:

None

Job Id: **344.1-011022-1**
Certificate No: **MEDB0000724**

		READINGS [PPM]			
		INDICATED	MEASURED	GRAB SAMPLE	
CALIBRATION AND ZERO TEST	0	0	0	2.8	REMARKS:
	15	16.0	18.1	15.1	Crude oil type: Arabian Light
	50	62.0	47.9	56.3	
	100	125.0	120.0	124.4	
	200	228.0	194.0	202.7	
	400	594.6	388.1	590.9	
	600	839.3	624.5	852.2	
	800	986.0	965.7	996.3	Test Water Temperature: 14.2 °C
	1000	>1000	980.0	906.7	Re-Zero: No
					Recalibrate: No
RESPONSE TESTS					
NO. 1 CRUDE OIL					REMARKS:
	15	29.3	29.8	29.9	Crude oil type: Nordic Yukon
	150	147.0	146.0	155.1	Note 1: Automatic cleaning device for measuring cell (wiper)operating during test
90% M.F.S.V. = 900		903.0	866.0	887.4	
Recorded Zero		0			Re-Zero: Yes
					Time: n.a.
					Recalibrate: Yes
					Time: n.a.
					Clean: See note 1
NO. 2 CRUDE OIL					REMARKS:
	15	13.0	15.7	12.7	Crude oil type: Arabian Light
	150	150.5	142.4	138.2	Measuring cell replaced due to leakage
90% M.F.S.V. = 900 (Maximum Full-Scale Value)		928.0	878.2	973.9	Note 1: Automatic cleaning device for measuring cell (wiper)operating during test
Recorded Zero		0			Re-Zero: Yes
					Time: n.a.
					Recalibrate: Yes
					Time: n.a.
					Clean: See note 1
					Time: n.a.

RESPONSE TESTS	READINGS [PPM]			
	INDICATED	MEASURED	GRAB SAMPLE	
NO. 3 CRUDE OIL				REMARKS:
15	13.1	9.8	9.9	Crude oil Type: Saratov Varanday
150	148.3	138.2	157.3	Note 1: Automatic cleaning device for measuring cell
90% M.F.S.V. = 900	890.0	853.0	941.2	(wiper)operating during test
Recorded Zero	0			Re-Zero: No
				Time: n.a.
				Recalibrate: No
				Time: n.a.
				Clean: See note 1
				Time: n.a.
NO. 4 CRUDE OIL				REMARKS:
15	14.0	12.3	16.6	Crude oil type: Bachaquero
150	160.8	142.8	175.1	Note 1: Automatic cleaning device for measuring cell
90% M.F.S.V. = 900	913.0	928.0	976.4	(wiper)operating during test
Recorded Zero	0			Re-Zero: No
				Time: n.a.
				Recalibrate: No
				Time: n.a.
				Clean: See note 1
				Time: n.a.
NO. 5 CRUDE OIL				REMARKS:
15	59.0	50.0	59.9	Crude oil type: Siri Knutsen
150	197.0	212.0	213.2	Note 1: Automatic cleaning device for measuring cell
90% M.F.S.V. = 900	960.0	916.0	979.8	(wiper)operating during test
Recorded Zero	0			Re-Zero: Yes
				Time: n.a.
				Recalibrate: Yes
				Time: n.a.
				Clean: See note 1
				Time: n.a.

RESPONSE TESTS		READINGS [PPM]			
		INDICATED	MEASURED	GRAB SAMPLE	
MARINE RESIDUAL FUEL OIL					REMARKS:
RMG 35-ISO 8217	15	21.0	8.9	24.6	Note 1: Automatic cleaning device for measuring cell (wiper)operating during test
	150	124.0	126.2	118.7	
90% M.F.S.V. = 900		901.0	941.6	955.2	
Recorded Zero		0			Re-Zero: No
					Time: n.a.
					Recalibrate: No
					Clean: See note 1
AUTOMOTIVE GASOLINE					REMARKS:
	15	32.0	34.6	34.9	Note 1: Automatic cleaning device for measuring cell (wiper)operating during test
	150	136.0	153.0	142.3	
90% M.F.S.V. = 900		837.0	860.0	908.5	
Recorded Zero		0			Re-Zero: Yes
					Time: n.a..
					Recalibrate: Yes
					Clean: See note 1
KEROSENE					REMARKS:
	15	28.0	27.1	25.8	Note 1: Automatic cleaning device for measuring cell (wiper)operating during test
	150	141.4	157.9	136.1	
90% M.F.S.V. = 900		835.9	849.0	862.9	
Recorded Zero		0			Re-Zero, Recalibrate: Yes
					Time: n.a.
					Clean: See note 1
MARINE DISTILLATE FUEL OIL					REMARKS:
DMA-ISO 8217	15	27.0	21.7	30.2	Note 1: Automatic cleaning device for measuring cell (wiper)operating during test
	150	144.3	143.0	139.5	
90% M.F.S.V. = 900		896.1	866.3	874.9	
Recorded Zero		0			Re-Zero, Recalibrate: Yes
					Time: n.a.
					Clean: See note 1

INDIVIDUAL BIOFUEL BLENDS AND CONCENTRATIONS

	READINGS [PPM]			
BIO-FUEL BLEND 75% Petroleum Oil Diesel Oil 75% Fatty acid methyl ester 25%	INDICATED	MEASURED	GRAB SAMPLE	REMARKS:
15	16	18	15	
150	97	110	91	
90% M.F.S.V. = 900	830	940	780	
Recorded Zero	0			Re-Zero: No Time: n.a. Recalibrate: No Time: n.a. Clean: No Time: n.a.
BIO-FUEL BLEND 99% Petroleum Oil Diesel Oil 99% Fatty acid methyl ester				REMARKS:
15	14	15	22	
150	105	92	105	
90% M.F.S.V. = 900	818	800	745	
Recorded Zero	0			Re-Zero: No Time: n.a. Recalibrate: No Time: n.a. Clean: No Time: n.a.

RESPONSE TIMES

First detectable reading			5.5	sec.	
	63	ppm	10.0	sec.	①
	90	ppm	15.0	sec.	
Stabilized maximum reading or 100 ppm	100	ppm	21.0	sec.	
First detectable drop			3.2	sec.	
	37	ppm	10.8	sec.	②
	10	ppm	15.5	sec.	
Stabilized minimum reading	0	ppm	20.5	sec.	
Response Time = $\frac{① + ②}{2}$			10.4	sec.	

REMARKS

Delay time of the piping system measured is 7.63s, accordingly response time of the meter is 10.4s – 7.63s = 2.80s

OIL FOULING AND CALIBRATION SHIFT

10 % OIL CONCENTRATION TEST

First detectable response			1.6	sec.
	15	ppm	2.8	sec.
	100	ppm	11.5	sec.
Off scale on highest range			43	sec.
On scale on highest range			9	sec.
	100	ppm	21	sec.
	15	ppm	45	sec.
Minimum reading	0	ppm	65	sec.
Further cleaning required (state extent)			No*	
Time			--	min.

100 % OIL CONCENTRATION TEST

First detectable response			1.1	sec.
	15	ppm	1.8	sec.
	100	ppm	10.1	sec.
Off scale on highest range			48	sec.
On scale on highest range			26	sec.
	100	ppm	46	sec.
	15	ppm	214	sec.
Minimum reading	0	ppm	253	sec.
Further cleaning required (state extent)			No*	
Time			--	min.
Calibration shift	0	ppm		

CONTAMINANT TEST

Meter reading shift with 300 ppm non-oil contaminants mixed with water and No.2 crude oil in oil concentrations of:

15 ppm	- 5.5	ppm
100 ppm	-6.0	ppm
300 ppm	-18.0	ppm

AIR ENTRAINMENT TEST

Meter reading shift with 1 % air entrained in water and No.2 crude oil added in concentrations of:

15 ppm	109.5	ppm
100 ppm	202.5	ppm
300 ppm	409.2	ppm

OIL PARTICLE SIZE TEST

Meter reading shift	26.0	ppm

TEMPERATURE TEST

Calibration test water temperature	13.0	°C
Meter reading shift at 10°C	0.0	ppm
Meter reading shift at 65°C	170.0	ppm

SAMPLE PRESSURE OR FLOW TEST

Meter reading shift at 50° of normal	22.0	ppm
Meter reading shift at 200° of normal	1.0	ppm
Deviations from this test should be stated if necessary	None	

SHUT-OFF TEST

Meter reading before shut-off	103.0	ppm
Meter reading after start-up (minimum dry period 8 hours)	95.0	ppm
Damage to meter as follows:	No damage to cell or any electrical component	

UTILITIES SUPPLY VARIATION TEST

110 %	voltage effects	No effect.
90 %	voltage effects	No effect.
110 %	air pressure effects	n.a.
90 %	air pressure effects	n.a.
110 %	hydraulic pressure effects	n.a.
90 %	hydraulic pressure effects	n.a.

OTHER COMMENTS

None

CALIBRATION AND ZERO DRIFT TEST

Calibration drift	3.6	ppm
Zero drift	5.8	ppm

SHUTDOWN AND RE-ENERGIZATION TEST

Span drift	8.4	ppm
Zero drift	0.0	ppm
Time for warm-up and calibration	0.0	min.

End of the Appendix