



U. S. Department of Homeland Security
United States Coast Guard
Certificate of Approval

Coast Guard Approval Number: 162.050/9119/2

Expires: 16 June 2025

OIL POLLUTION PREVENTION EQUIPMENT

The following device has been tested in accordance with IMO resolution MEPC.108(49)

VAF INSTRUMENTS B.V.
P O BOX 40
DORDRECHT 3300AA NETHERLANDS

Model: Oilcon Mark 6 M; Cargo Monitor

This is to certify that the equipment listed has been examined and tested in accordance with the requirements of the specifications contained in part 1 of the annex to the guidelines and specifications contained in IMO resolution MEPC.108(49).

Equipment manufactured by VAF Instruments B.V. to specification/assembly drawing numbers 0806-1280-3 dated September 20, 2004, 0806-1280 Rev. F dated May 22, 2015, and 0806-1288 Rev. D dated May 11, 2017. Sample feed pump manufactured by VAF Instruments B.V. to specification/assembly drawing numbers 0806-1076-3 dated October 25, 2001 and 0806-1076 Rev. I dated May 2, 2019. Control equipment manufactured by VAF Instruments B.V. to specification/assembly drawing numbers 0206-0088 dated November 21, 2011, 0206-0088 Rev. B dated July 4, 2012, 0806-1282-3 Rev. B dated March 21, 2011, 0806-1282-3 dated September 20, 2004, and 0806-1306 Rev. D dated April 15, 2020.

The cargo monitor is acceptable for the following applications: Crude Oils, "Black" products, and "White" products.

Test data and results attached in the appendix.

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

This certificate documents compliance with 46 CFR 162.050.

This certificate supersedes Approval number 162.050/9119/1 dated June 16, 2020; update includes new E.P.U, flowmeter, and wash pump.

*** End ***

THIS IS TO CERTIFY THAT the above named manufacturer has submitted to the undersigned satisfactory evidence that the item specified herein complies with the applicable laws and regulations as outlined on the reverse side of this Certificate, and approval is hereby given. This approval shall be in effect until the expiration date hereon unless sooner canceled or suspended by proper authority.

GIVEN UNDER MY HAND THIS 16th DAY OF
JUNE 2020, AT WASHINGTON D.C.

J. J. MIN
Chief, Engineering Division
BY DIRECTION OF THE COMMANDANT



TERMS: The approval of the item described on the face of the Certificate has been based upon the submittal of satisfactory evidence that the item complies with the applicable provisions of the navigation and shipping laws and the applicable regulations in Title 33 and/or Title 46 of the Code of Federal Regulations. The approval is subject to any conditions noted on this Certificate and in the applicable laws and regulations governing the use of the item on vessels subject to Coast Guard inspection or on other vessels and boats.

Consideration will be given to an extension of this approval provided application is made 3 months prior to the expiration date of this Certificate.

The approval holder is responsible for making sure that the required inspections or tests of materials or devices covered by this approval are carried out during production as prescribed in the applicable regulations.

The approval of the item covered by this certificate is valid only so long as the item is manufactured in conformance with the details of the approved drawings, specifications, or other data referred to. No modification in the approved design, construction, or materials is to be adopted until the modification has been presented for consideration by the Commandant and confirmation received that the proposed alteration is acceptable.

NOTICE: Where a manufacturer of safety-at-sea equipment is offering for sale to the maritime industry, directly or indirectly, equipment represented to be approved, which fails to conform with either the design details or material specifications, or both, as approved by the Coast Guard, immediate action may be taken to invoke the various penalties and sanctions provided by law including prosecution under 46 U.S.C. 3318, which provides:

"A person that knowingly manufactures, sells, offers for sale, or possesses with intent to sell, any equipment subject to this part (*Part B. of Subtitle II of Title 46 U.S.C.*) and the equipment is so defective as to be insufficient to accomplish the purpose for which it is intended, shall be fined not more than \$10,000, imprisoned for not more than 5 years or both."

APPENDIX

U. S. Coast Guard Approval Number: 162.050/9119/2

Expires: 16 June 2025

TEST DATA AND RESULTS OF TESTS CONDUCTED ON AN OIL CONTENT METER IN ACCORDANCE WITH PART 1 OF THE ANNEX TO THE GUIDELINES AND SPECIFICATIONS CONTAINED IN IMO RESOLUTION MEPC.108(49)

Oil content meter supplied by:

VAF Instruments B.V.

Test location:

VAF Instruments B.V.
Vierlinghstraat 24, 3316 EL Dordrecht
The Netherlands

Method of sample analysis:

ISO 9377-2-2000

Samples analyzed by:

Institut Fresenius AG
Im Maisel 14
D-65232 Taunusstein
Germany

Environmental testing of the electrical and electronic sections of the oil content meter has been carried out in accordance with part 2 of the annex to the Guidelines and Specifications contained in IMO Resolution MEPC.108(49). The equipment functioned satisfactorily on completion of each test specified on the environmental test protocol.

Calibration Test

READINGS (ppm)			
Calibration No. 2 Crude Oil (Arabian Light)	Indicated	Measured	Grab Sample
0	0	0	0
15	13	16	21
50	43	42	40
100	108	111	103
200	198	209	190
400	394	410	357
600	604	619	553
800	795	805	805
1000	902	912	951
Water Temperature	28.0°C		
Re-zero	NO		
Recalibrate	NO		

APPENDIX

U. S. Coast Guard Approval Number: 162.050/9119/2

Expires: 16 June 2025

**TEST DATA AND RESULTS OF TESTS
CONDUCTED ON AN OIL CONTENT METER IN ACCORDANCE WITH PART 1
OF THE ANNEX TO THE GUIDELINES AND SPECIFICATIONS
CONTAINED IN IMO RESOLUTION MEPC.108(49)**

OIL TYPE RESPONSE TESTS

READINGS (ppm)

Oil Type 0 (No. 0 MDO)	Indicated	Measured	Grab Sample
15	20	15	14
100	102	94	91
900	965	888	842
Recorded Zero	0	0	
Re-zero	NO		
Recalibrate	NO		
Clean	NO		

READINGS (ppm)

Oil Type 1 No. 1 Crude Oil (Saharan Blend)	Indicated	Measured	Grab Sample
15	13	12	14
100	107	103	100
900	915	896	821
Recorded Zero	0	0	
Re-zero	NO		
Recalibrate	NO		
Clean	NO		

READINGS (ppm)

Oil Type 3 No. 3 Crude Oil (HSGO)	Indicated	Measured	Grab Sample
15	17	14	16
100	101	101	106
900	907	842	859
Recorded Zero	0	0	
Re-zero	NO		
Recalibrate	NO		
Clean	NO		

READINGS (ppm)

Oil Type 4 No. 4 Crude Oil (BCF-17)	Indicated	Measured	Grab Sample
15	9	13	17
100	85	82	67
900	902	919	910
Recorded Zero	0	0	
Re-zero	NO		
Recalibrate	NO		
Clean	NO		

APPENDIX

U. S. Coast Guard Approval Number: 162.050/9119/2

Expires: 16 June 2025

**TEST DATA AND RESULTS OF TESTS
 CONDUCTED ON AN OIL CONTENT METER IN ACCORDANCE WITH PART 1
 OF THE ANNEX TO THE GUIDELINES AND SPECIFICATIONS
 CONTAINED IN IMO RESOLUTION MEPC.108(49)**

READINGS (ppm)

Oil Type 5 No. 5 Crude Oil (DAQING)	Indicated	Measured	Grab Sample
15	11	10	15
100	95	90	80
900	889	864	780
Recorded Zero	0	0	
Re-zero	NO		
Recalibrate	NO		
Clean	NO		

READINGS (ppm)

Oil Type 6 No. 6 Crude Oil (RMG 35)	Indicated	Measured	Grab Sample
15	17	24	24
100	88	81	65
900	825	785	624
Recorded Zero	0	0	
Re-zero	NO		
Recalibrate	NO		
Clean	NO		

READINGS (ppm)

Calibration Oil Type 7 (Automotive Gasoline)	Indicated	Measured	Grab Sample
15	19	14	-
100	108	102	-
900	902	863	-
Recorded Zero	0	0	
Re-zero	NO		
Recalibrate	NO		
Clean	NO		

READINGS (ppm)

Oil Type 8 (Kerosene)	Indicated	Measured	Grab Sample
15	12	10	9
100	105	102	106
900	842	769	842
Recorded Zero	0	0	
Re-zero	NO		
Recalibrate	NO		
Clean	NO		

APPENDIX

U. S. Coast Guard Approval Number: 162.050/9119/2

Expires: 16 June 2025

**TEST DATA AND RESULTS OF TESTS
CONDUCTED ON AN OIL CONTENT METER IN ACCORDANCE WITH PART 1
OF THE ANNEX TO THE GUIDELINES AND SPECIFICATIONS
CONTAINED IN IMO RESOLUTION MEPC.108(49)**

INDIVIDUAL BIOFUEL BLENDS AND CONCENTRATIONS**READINGS (ppm)**

Oil Type 10 (Biofuel Blend 75% Diesel, 25% Vegetable Oil)	Indicated	Measured	Grab Sample
15	13	14	24
100	92	101	99
900	863	889	876
Recorded Zero	0	0	
Re-zero	NO		
Recalibrate	NO		
Clean	NO		

READINGS (ppm)

Oil Type 11 (Biofuel Blend 99% Diesel, 1% Vegetable Oil)	Indicated	Measured	Grab Sample
15	16	14	5
100	93	101	112
900	938	887	914
Recorded Zero	0	0	
Re-zero	NO		
Recalibrate	NO		
Clean	NO		

READINGS (ppm)

Oil Type 12 (Biofuel Blend 75% Diesel, 25% Alkanes C10-C26, Flashpoint >60C)	Indicated	Measured	Grab Sample
15	22	15	7
100	100	101	107
900	845	878	841
Recorded Zero	0	0	
Re-zero	NO		
Recalibrate	NO		
Clean	NO		

READINGS (ppm)

Oil Type 13 (Biofuel Blend 99% Diesel, 1% Alkanes C10-C26, Flashpoint >60C)	Indicated	Measured	Grab Sample
15	16	15	4
100	93	102	131
900	884	889	999
Recorded Zero	0	0	
Re-zero	NO		
Recalibrate	NO		
Clean	NO		

APPENDIX

U. S. Coast Guard Approval Number: 162.050/9119/2

Expires: 16 June 2025

**TEST DATA AND RESULTS OF TESTS
 CONDUCTED ON AN OIL CONTENT METER IN ACCORDANCE WITH PART 1
 OF THE ANNEX TO THE GUIDELINES AND SPECIFICATIONS
 CONTAINED IN IMO RESOLUTION MEPC.108(49)**

READINGS (ppm)

Oil Type 14 (Biofuel Blend 75% Diesel, 25% Alkanes C10-C26, Flashpoint \leq60C)	Indicated	Measured	Grab Sample
15	23	15	2
100	101	102	132
900	842	891	960
Recorded Zero	0	0	
Re-zero	NO		
Recalibrate	NO		
Clean	NO		

READINGS (ppm)

Oil Type 15 (Biofuel Blend 99% Diesel, 1% Alkanes C10-C26, Flashpoint \leq60C)	Indicated	Measured	Grab Sample
15	23	15	3
100	104	102	198
900	851	895	934
Recorded Zero	0	0	
Re-zero	NO		
Recalibrate	NO		
Clean	NO		

READINGS (ppm)

Oil Type 16 (Biofuel Blend 75% Gasoline, 25% Bio-Ethanol)	Indicated	Measured	Grab Sample
15	8	15	14
100	95	102	112
900	852	891	848
Recorded Zero	0	0	
Re-zero	NO		
Recalibrate	NO		
Clean	NO		

READINGS (ppm)

Oil Type 17 (Biofuel Blend 99% Gasoline, 1% Bio-Ethanol)	Indicated	Measured	Grab Sample
15	15	14	12
100	97	104	91
900	850	878	799
Recorded Zero	0	0	
Re-zero	NO		
Recalibrate	NO		
Clean	NO		

APPENDIX

**U. S. Coast Guard Approval Number: 162.050/9119/2
Expires: 16 June 2025**

**TEST DATA AND RESULTS OF TESTS
CONDUCTED ON AN OIL CONTENT METER IN ACCORDANCE WITH PART 1
OF THE ANNEX TO THE GUIDELINES AND SPECIFICATIONS
CONTAINED IN IMO RESOLUTION MEPC.108(49)**

READINGS (ppm)

Oil Type 18 (Biofuel Blend 75% Diesel, 25% FAME)	Indicated	Measured	Grab Sample
15	10	15	4
100	93	99	110
900	860	898	879
Recorded Zero	0	0	
Re-zero	NO		
Recalibrate	NO		
Clean	NO		

READINGS (ppm)

Oil Type 19 (Biofuel Blend 99% Diesel, 1% FAME)	Indicated	Measured	Grab Sample
15	14	15	9
100	98	106	99
900	886	885	865
Recorded Zero	0	0	
Re-zero	NO		
Recalibrate	NO		
Clean	NO		

APPENDIX

U. S. Coast Guard Approval Number: 162.050/9119/2

Expires: 16 June 2025

TEST DATA AND RESULTS OF TESTS CONDUCTED ON AN OIL CONTENT METER IN ACCORDANCE WITH PART 1 OF THE ANNEX TO THE GUIDELINES AND SPECIFICATIONS CONTAINED IN IMO RESOLUTION MEPC.108(49)

RESPONSE TIMES	ppm	SECONDS	
First detectable reading		4.5	
	63	7.9	(1)
	90	15.3	
Stabilized maximum reading	110	28.8	
First detectable drop		6.7	
	37	13.6	(2)
	10	20.0	
Stabilized minimum reading	0	26.6	
Response time = ((1) + (2)) / 2 =		10.8	

OIL FOULING AND CALIBRATION SHIFT

10% oil concentration test

First detectable response		5.0	
	15	5.0	
	100	5.0	
Off scale on highest range		22.4	
On scale on highest range		17.5	
	100	-	
	15	-	
Minimum reading	0	17.5	
Further cleaning required	NO		

100% oil concentration test

First detectable response		7.5	
	15	7.5	
	100	7.5	
Off scale on highest range		20.6	
On scale on highest range		19.8	
	100	-	
	15	-	
Minimum reading	0	19.8	
Further cleaning required	NO		

CONTAMINANT TEST

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

- 15 ppm	- 3 ppm
- 100 ppm	- 4 ppm
- 300 ppm	+ 23 ppm

*Mixture of 270 ppm Attapulgite and 30 ppm Iron Oxide

AIR ENTRAINMENT TEST

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

- 15 ppm	+ 45 ppm
- 100 ppm	+ 34 ppm
- 300 ppm	+ 25 ppm

OIL PARTICLE SIZE TEST

APPENDIX

U. S. Coast Guard Approval Number: 162.050/9119/2

Expires: 16 June 2025

TEST DATA AND RESULTS OF TESTS CONDUCTED ON AN OIL CONTENT METER IN ACCORDANCE WITH PART 1 OF THE ANNEX TO THE GUIDELINES AND SPECIFICATIONS CONTAINED IN IMO RESOLUTION MEPC.108(49)

Not performed

TEMPERATURE TEST

Calibration test water temperature	16°C
Meter reading shift at 10°C	-2 ppm
Meter reading shift at 65°C	+6 ppm

SAMPLE PRESSURE OR FLOW TEST

Meter reading shift at 50% of normal (0.7 bar)	+ 5 ppm
Meter reading shift at 200% of normal (3.0 bar)	- 7 ppm

Deviations from this test should be stated if necessary

SHUT-OFF TEST

Meter reading before shut-off	132 ppm	(Injection: 128 ppm)
Meter reading after start-up (minimum dry period 8 hours)	106 ppm	(Injection: 103 ppm)
Meter reading shift	- 1 ppm	

UTILITIES SUPPLY VARIATION TEST

	Meter Rading Shift (ppm)
110 % voltage effects	- 1
90 % voltage effects	+ 1
110 % air pressure effects	Not applicable
90 % air pressure effects	Not applicable
110 % hydraulic pressure effects	Not applicable
90 % hydraulic pressure effects	Not applicable

CALIBRATION AND ZERO DRIFT TEST

Calibration Drift	+ 2 ppm
Zero Drift	± 0 ppm

SHUTDOWN AND RE-ENERGIZATION TEST

Span Drift	± 0 ppm
Zero Drift	± 0 ppm
Time for warm-up and calibration	4 mins

*** END ***