



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

Coast Guard Approval Number: 162.050/9119/2

Expires: 16 June 2030

OIL POLLUTION PREVENTION EQUIPMENT
OIL DISCHARGE MONITORING EQUIPMENT: (ODME)/CARGO MONITOR
COMPLIANCE WITH TITLE 46 CFR PART 162.050 AND MARPOL ANNEX I REGULATION 31/MEPC.108(49)

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

Model: Oilcon Mark 6M

This Type Approval Certificate documents compliance that the above listed ODME, within the authorizations and limitations below, has been verified to conform with the requirements of Title 46 Code of Federal Regulations (CFR) Part 162.050 and IMO MARPOL Annex I Regulation 31/Resolution MEPC.108(49).

Supporting documentation including the design drawings, independent laboratory (IL) report, operations manual, test data, and reports are listed in the Appendix of this certificate.

Operational/Installation Limitations or Authorizations:

The models listed above shall be installed and operated in accordance with the manufacturer's operations manual (see Appendix).

The models listed above are acceptable for the following applications:

Crude Oils
"Black" Products
"White" Products

This Type Approval Certificate includes the above listed ODME /cargo monitor manufactured during the period of validity of this certificate. A copy of this certificate should be carried on board a vessel fitted with this equipment at all times. This type approval remains valid for equipment manufactured at any time during the period of validity of this certificate, even after the expiration date has passed.

*** 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 7th DAY OF
MAY 2026, AT WASHINGTON D.C.

J. D. BALDASSINI
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."

SUPPORTING DOCUMENTATION

Design Drawings:

VAF Instruments B.V. Drawing No. 0806-1280-3 Rev. -- dated September 20, 2004
VAF Instruments B.V. Drawing No. 0806-1280 Rev. F dated May 22, 2015
VAF Instruments B.V. Drawing No. 0806-1288 Rev. D dated May 11, 2017 (Sample Feed Pump)
VAF Instruments B.V. Drawing No. 0806-1076 Rev. I dated May 2, 2019 (Sample Feed Pump)
VAF Instruments B.V. Drawing No. 0206-0088 Rev. -- dated November 21, 2011 (Control Equipment)
VAF Instruments B.V. Drawing No. 0206-0088 Rev. B dated July 4, 2012 (Control Equipment)
VAF Instruments B.V. Drawing No. 0806-1282-3 Rev. B dated March 21, 2011 (Control Equipment)
VAF Instruments B.V. Drawing No. 0806-1282-3 Rev. -- dated September 20, 2004 (Control Equipment)
VAF Instruments B.V. Drawing No. 0806-1306 Rev. D dated April 15, 2020 (Control Equipment)

Independent Laboratory Report:

Istitut Fresenius AG Test Report, "Test report for the Oil discharge monitoring & control system," dated November 11, 2014

Operations Manual:

VAF Instruments 642 Oilcon Mark 6M Technical Manual Rev. TIB-GB-0924

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

ODME /Cargo monitor submitted 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(E)

Samples analyzed by:

Institut Fresenius AG
Im Maisel 14
D-65232 Taunusstein
Germany

Environmental testing of the electrical and electronic components of this equipment 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 protocols.

APPENDIX
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Calibration Test:

READINGS (ppm)			
Calibration Oil Type 2 (No. 2 Arabian Lt. Crude Oil)	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 °C		
Re-zero	NO		
Recalibrate	NO		

Oil Type Response Tests:

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		

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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		

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)			
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		

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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		

READINGS (ppm)			
Oil Type 10 (Bio-fuel 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 (Bio-fuel 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 (Bio-fuel 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		
Re-zero	NO		
Recalibrate	NO		
Clean	NO		

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READINGS (ppm)			
Oil Type 13 (Bio-Fuel Blend 99% Petroleum Oil)	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		

READINGS (ppm)			
Oil Type 14 (Bio-Fuel Blend 75% Petroleum Oil)	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 (Bio-Fuel Blend 99% Petroleum Oil)	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 (Bio-Fuel Blend 75% Petroleum Oil)	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		

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READINGS (ppm)			
Oil Type 17 (Bio-Fuel Blend 99% Petroleum Oil)	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		

READINGS (ppm)			
Oil Type 18 (Bio-Fuel Blend 75% Petroleum Oil)	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 (Bio-Fuel Blend 99% Petroleum Oil)	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		

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RESPONSE TIMES	ppm	Seconds	
First detectable reading		4.5	
	63.0	7.9	(1)
	90.0	15.3	
Stabilized maximum reading or 100 ppm	110.0	28.8	
First detectable drop		6.7	
	37.0	13.6	(2)
	10.0	20.0	
Stabilized minimum reading	0.0	26.6	
Response time = (1) + (2)) / 2 =	-----	10.8	

OIL FOULING AND CALIBRATION SHIFT

10% oil concentration test			
First detectable response	-----	5.0	
	15.0	5.0	
	100.0	5.0	
Off scale on highest range	-----	22.4	
On scale on highest range	-----	17.5	
	100.0	-----	
	15.0	-----	
Minimum reading	0.0	17.5	
Further cleaning required	NO	-----	

100% OIL CONCENTRATION TEST

First detectable response	-----	7.5	
	15.0	7.5	
	100.0	7.5	
Off scale on highest range	-----	20.6	
On scale on highest range	-----	19.8	
	100.0	-----	
	15.0	-----	
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	- 3.0 ppm
100 ppm	- 4.0 ppm
300 ppm	+ 23.0 ppm

*Mixture of 270 ppm Attapulgitte 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:

Oil Concentration	Display
15.0 ppm	45.0 ppm
100.0 ppm	34.0 ppm
300.0 ppm	25.0 ppm

OIL PARTICLE SIZE TEST

Not performed

TEMPERATURE TEST

Calibration test water temperature	16.0 °C
Meter reading shift at 10.0 °C	- 2.0 ppm
Meter reading shift at 65.0 °C	+ 6.0 ppm

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SAMPLE PRESSURE OR FLOW TEST

Meter reading shift at 50% of normal (0.7 bar)	+ 5.0 ppm
Meter reading shift at 200% of normal (3.0 bar)	- 7.0 ppm
Deviations from test requirements:	None

SHUT-OFF TEST

Meter reading before shut-off	132.0 ppm	(Injection: 128.0 ppm)
Meter reading after start-up after 8 hours dry period:	106.0 ppm	(Injection: 103.0 ppm)
Meter reading shift	- 1.0 ppm	
Damage to Cargo Monitor:	No damage was noted to the cell or any electrical component	

UTILITIES SUPPLY VARIATION TEST

	Meter Reading Shift
110 % voltage effects	- 1.0 ppm
90 % voltage effects	+ 1.0 ppm
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	2.0 ppm
Zero Drift	± 0.0 ppm

SHUTDOWN AND RE-ENERGIZATION TEST IMO MEPC.108(49)

Span Drift	± 0.0 ppm
Zero Drift	± 0.0 ppm
Time for warm-up and calibration	4 mins

*** END ***