

DX1 - REFERENCE CASES

CEMENT TANKER

JANUARY 2022 - JUNE 2022



Type ship	M2 Kempenaar
European number	2311999
Dimensions, L x B x H	53,21 x 6,60 x 5,28
Draft, mtr	2.70
Year built	1965
Type cargo	Cement-powder
Laadcapaciteit / tonnage	515t
Type engines	Caterpillar 3406 DITA
Year built engines	2007, last overhaul 2019
Emission class engines CCR-0 / CCR-1 / CCR-2 / Stage V	CCR-1/ Stage 1
KW @ RPM	298/1800rpm
Fuel type	MGO, EN590-B0



The specified performance of the Caterpillar C3406 is 298 kW @ 1800 tpm.

The gear-ratio is 1:4,057

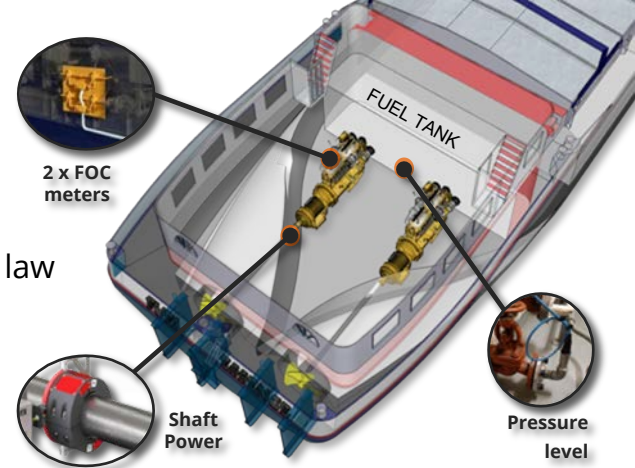


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Measurement executed according to ISO-8178-2 E3 Marine application propeller law

Mode number	1	2	3	4
Engine speed, %	100	91	80	63
Power, %	100	75	50	25
Weighting factor	0.2	0.5	0.15	0.15



DX1 Dosing & Measurement Milestones

- 25 January 2022 Emission reference measurement by KW3 (accredited)
- 20 March 2022 Installation **SU|MO Platform incl. Shaft Power Meter**
- 12 April 2022 DX1 cleaning cycle, dosing ratio 1:250
- 25 April 2022 DX1 normal cycle, dosing ratio 1:1280
- 31 May 2022 Emission test KW3 + SUMO performance monitoring
- 24 June 2022 Comparison fuel consumption vs reference

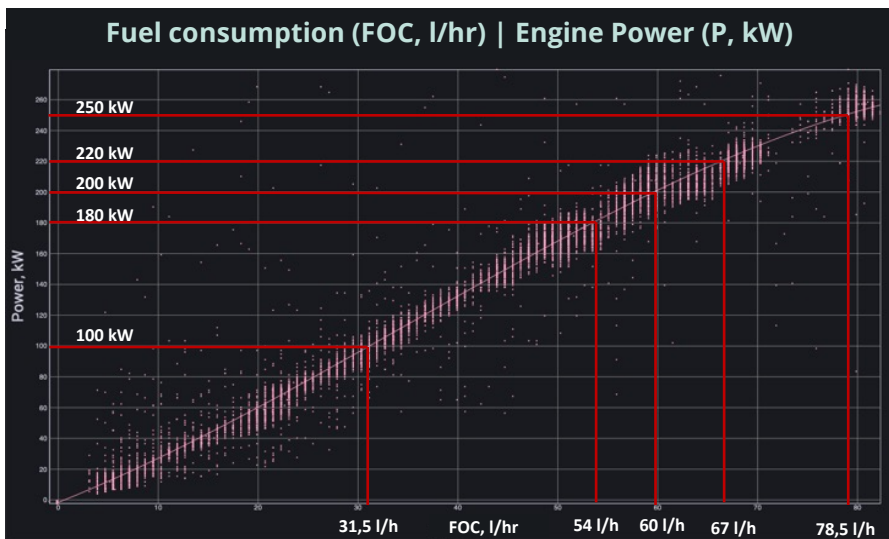
NO DX1 was added to engine oil



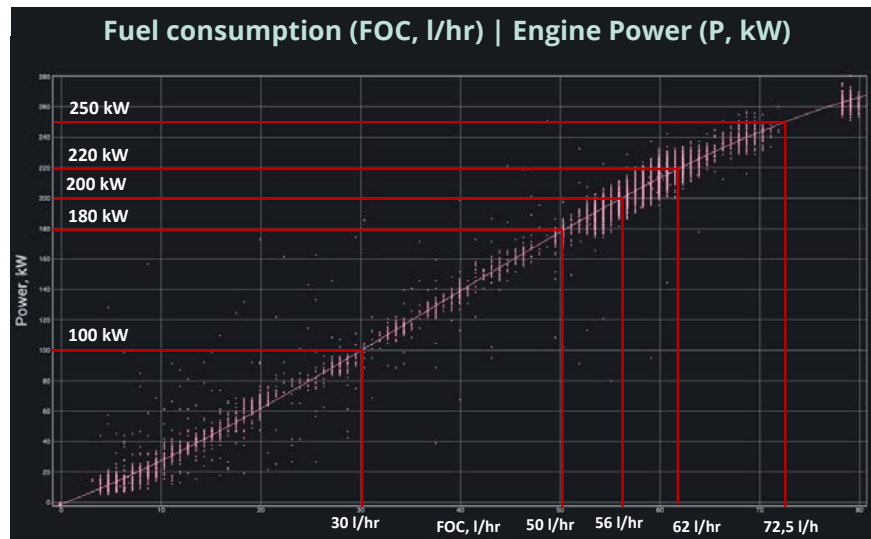
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CEMENT TANKER: MTS DE PRINSENGRACHT

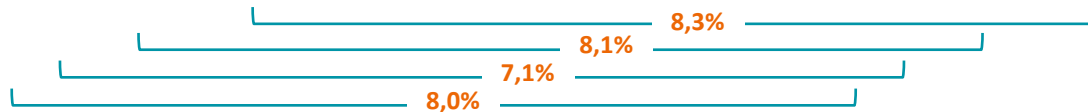
SPECIFIC FUEL CONSUMPTION before DX1
21 March - 25 March 2022 | 5 days consecutive



SPECIFIC FUEL CONSUMPTION after DX1
20 June - 24 June 2022 | 5 days consecutive



FOC Saving during normal conditions



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EMISSION REDUCTION

ACCREDITED MEASUREMENTS by KW3				
	Unit	without DX1 25 January 2022	with DX1 31 May 2022	% improvement
CO ₂	[g/kWh]	830.2	753.6	10.2
CO	[g/kWh]	1.82	1.49	22.1
NOx as NO2	[g/kWh]	7.77	7.92	-1.9
PM	[g/kWh]	0.202	0.096	47.5

