



CJC[®] Oil Care is a Must for Green Shipping

Application Study | Lube Oil Care for 2-Stroke Diesel Engine



**CMS „HONG KONG EXPRESS“, 13,177 TEU and
CMS „HAMBURG EXPRESS“, 13,177 TEU
Engines: MAN 11K98 ME MK 7.1, 45,100 kW**



Superintendent, Hapag-Lloyd AG: „The CJC Lube Oil Purifiers are proved as a reliable and efficient alternative for lube oil care during the excessive test periods on both vessels, which are accompanied by MAN Energy Solutions. Due to the continuous oil care the oil cleanliness, as well as the performance of the lube oil, is kept in the specified areas (viscosity, additives, base number, particle and water content) or improved (e. g. dispersancy). The high savings potential regarding oil losses, energy costs and CO₂-emissions are convincing – even as retrofit. An easy system with large effect.“





Application Study

Conventional Lubrication Oil Treatment vs. CJC® Oil-Care System

Engines

Vessel: CMS „HONG KONG EXPRESS“ and CMS „HAMBURG EXPRESS“, 13,177 TEU

Engine per vessel: MAN 11K98ME-C (derated to 45,100 kW at 84 rpm since 2015)
low-speed 2-stroke diesel engine

Running hours: approx. 8,000 RHs/year

Lube oil, Hong Kong Express: Mobilgard 300, 11.9 cSt @ 100 °C

Lube oil, Hamburg Express: LukOil Navigo 6 SO, 11.5 cSt @ 100 °C

Oil volume: 70 m³ (1.2 L/kW_{MCR})

Fieldtest

TEST PERIOD

Period: 45 weeks

Engine running hours: 5,244 RHs during test period

Test start: at approx. 24,556 RHs

Test end: at approx. 29,800 RHs

CONVENTIONAL LUBRICATING OIL TREATMENT:

Two systems for the main engine.

NEWLY INSTALLED OIL-CARE SYSTEM:

CJC® Oil-Care System 3x427/81 for continuous fine filtration and dewatering (24/7/365) was installed. The both conventional lubrication oil treatments systems weren't in operation throughout the test period.

Pump flow: 3,000 L/h

Filter material: 100 % renewable raw materials (cellulose)

Filtration degree: 3 µm absolute, 1 µm nominal

Dirt holding capacity: > 72 kg

OPTIONAL WITH OIL CONDITION MONITORING

The implementation of a CJC® Oil Condition Monitoring System on CMS Hong Kong Express enables the transfer of exact oil condition values in real-time to the command bridge. The sensor package detects differential pressure, temperature, relative humidity as well as particle content according to ISO 4406. Abnormal incidents, as well as harmful effects, can be indicated at the earliest and enable counteracting – timely, cost-efficient and project-able.



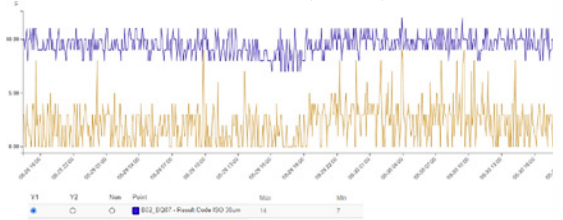
CJC® Oil-Care System 3x427/81 and integrated CJC® Fine Filter Insert LOX – specially developed for lubricating oil care on 2-stroke diesel engines

CJC® Oil Condition Monitoring

Relative humidity and temperature (filter inlet)



Particle content (ISO 4406)



Differential pressure – filter inlet/outlet

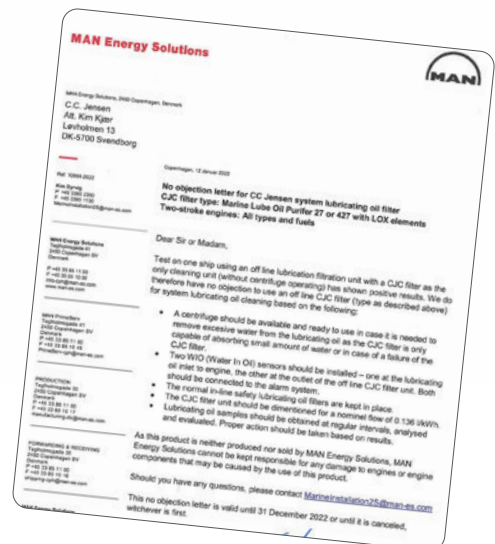


Approval: MAN Energy Solutions

APPROVAL FROM MAN ENERGY SOLUTIONS

No Objection Letter for CJC® Lubricating Oil System for 2-Stroke Engines: All Types and Fluids

„Test on several ships using an off-line lubrication filtration unit with a CJC® Filter as the only cleaning unit (without centrifugal operating) have shown positive results [...]“



Application Study

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Result – Oil cleanliness

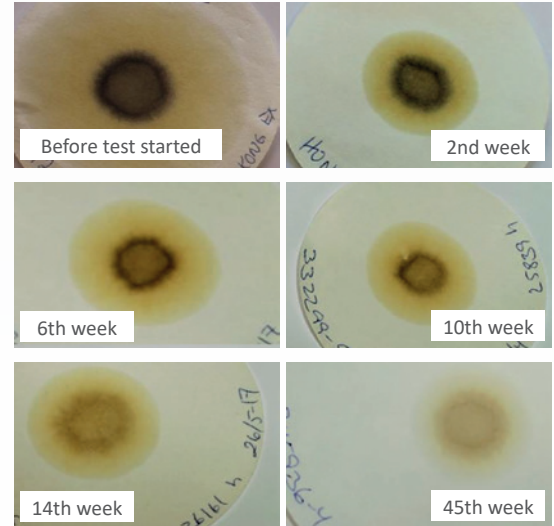
The weekly oil samples were examined by several independent oil laboratories (Filtrex, AlControl/Synlab). The oil condition has been rated as „normal“ throughout the whole test period:

- particle and water content minimized
- stable TBN
- stable viscosity
- no impact on additives

The quick test shows that the lubricating oil was heavily contaminated with dust, metal abrasion and other particles > 1 µm before and at the beginning of the test period. Additionally, oil ageing signs (brown colour), as well as higher water content were detected (serrated border zone). Thermal load on so-called hot spots (e. g. bearings) and particles from component wear (copper, iron, aluminium) accelerate the degradation of the base oil as well as of the additives and thus oil ageing processes. No fuel contamination was detected.

The efficient oil care with CJC® – not only particles and free water, but also water dissolved in the oil, as well as oil ageing products and acid compounds are continuously and permanently removed – has significantly improved the oil cleanliness throughout the test period (see pictures right side).

Quick test: oil and engine condition



Result – Savings regarding CO₂, as well as operating and energy costs

➤➤ APPROX. 98 % LOWER LUBE OIL CONSUMPTION CONCERNING LUBE OIL TREATMENT ≈ 9,846 L/YEAR AND VESSEL

Because of the CJC® Oil-Care System, Hapag-Lloyd saved 9,856 litres of lubricating oil a year solely due to the lower lube oil losses:

Oil losses due to filter insert replacement (CJC® Oil-Care System): only 144 litres/year

36 filter inserts x 2 l lubricating oil losses/insert x 2 filter replacements/year

➤➤ APPROX. 97 % LOWER ENERGY CONSUMPTION CONCERNING LUBE OIL TREATMENT ≈ 332,725 KWH/YEAR AND VESSEL

Using the CJC® Oil-Care System drastically reduces energy consumption:

CJC® Oil-Care System: only 10,253 kWh/year

Operation: 10,253 kWh/year (356 days x 24 h x 1.2 kW)



➤➤ LESS EMISSIONS DURING PORT TIMES

When using conventional lubricating treatment systems during port times, the steam needed for the preheating (heating capacity 9 kW) of the lube oil – from 36 °C to 92 °C – has to be produced by the auxiliary boilers.

When using CJC® Oil-Care System the preheating of the lube oil is not necessary with the result that no fuel has to be burned in the auxiliary boilers during port times – i. e. drastically savings of fuel and less emissions.

➤➤ APPROX. 96 % LESS CO₂-EMISSIONS CONCERNING LUBE OIL TREATMENT ≈ 154,535 KG/YEAR AND VESSEL

The extreme discrepancy of both systems concerning energy requirements and oil losses enables Hapag-Lloyd to significantly improve the CO₂-footprint of the CMS “HONG KONG EXPRESS” and CMS “HAMBURG EXPRESS” by using a CJC® Oil-Care System. The combustion of fuel and the thermal disposal of waste oil/sludge causes approx. 2.6 kg of CO₂ per 1 litre

Lower energy consumption:

CJC® Oil-Care System: only 6,247 kg CO₂/year

Operating: 6,247 kg CO₂/year (2,403 L fuel/year x 2.6 kg CO₂/L)

240 days shaft generator, HS-HFO (950 g/L), specific consumption 0.221 L/kWh

116 days auxiliary diesel engine, MDO (880 g/L), specific consumption 0.261 L/kWh

Lower quantities of sludge to be disposed of:

CJC® Oil-Care System: only 374 kg CO₂/year

144 L oil losses due to filter replacement/year x 2,6 kg CO₂/l



- worldwide



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History

Founded in 1928 and located in Hamburg, we develop and manufacture CJC™ Fine Filter technology since 1951. With substantial know-how and in-house analysis and test facilities we are experts when it comes to the maintenance of oils and fuels.



Quality

Competent advice and individual solutions, even for the most difficult filtration problems of our customers - that is our daily claim. The certification of our company according to DIN EN ISO 9001:2015 provides us with assurance and motivation.

CJC™ worldwide

CJC™ Fine Filter systems are available worldwide through subsidiaries and distributors.

Find your nearest distributor on our website www.cjc.de - or give us a call!

