



Condition Monitoring Solutions

International Maritime Organisation (IMO) 2020



ENGINEERING YOUR SUCCESS.

OVER 25 YEARS OF
INDUSTRY LEADING
ACHIEVEMENT

GROW WITH CONDITION MONITORING

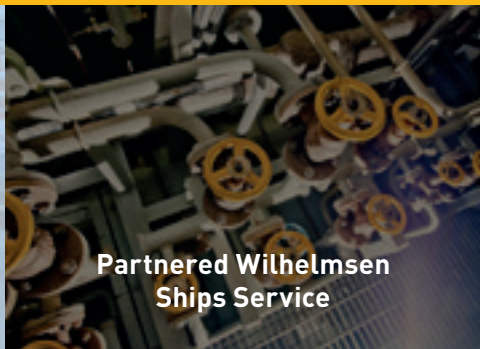
The story of Parker Kittiwake is one of continual innovation in condition monitoring and predictive maintenance solutions. Serving industries including marine, oil & gas, industrial and food manufacturing, we have over 25 years of being the market leaders. We are also the key OEM supplier of CM products to blue-chip customers world wide.

1990



Launched LCM

1995

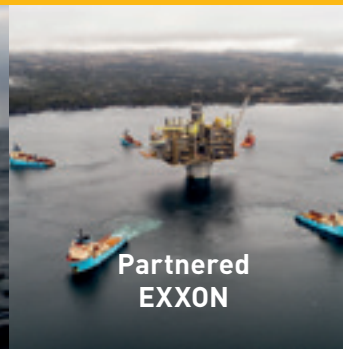


Partnered Wilhelmsen
Ships Service



Oil test centre developed
for UK Navy

1997



Partnered
EXXON

2011



Launched
PQL

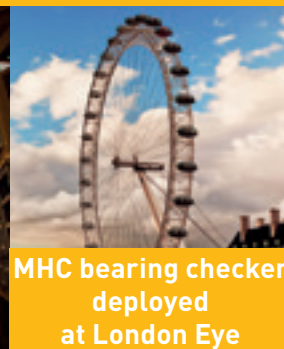


Acquired Holroyd
Instrumentation



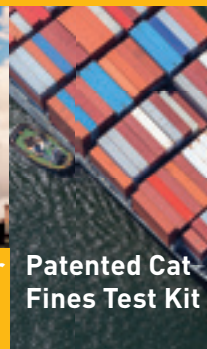
Acquired by Parker

2012



MHC bearing checker
deployed
at London Eye

2013



Patented Cat
Fines Test Kit

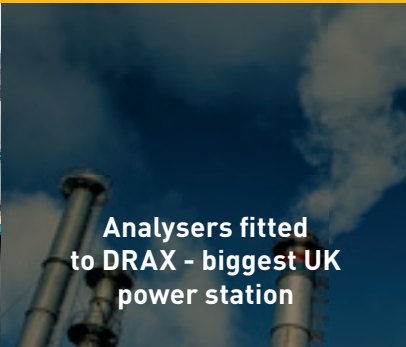




1999

2004

2010



Analysers fitted to DRAX - biggest UK power station



Investors in People



Launched LinerSCAN

2014

2016

2019

2021



Patented Cold Corrosion Test kit



Parker Kittiwake wins Engineering Innovation award



Launch LCM 30 and XRF



Launch DIGI Plus Cell

IMO 2020

On the 1st January 2020, the shipping industry witnessed unprecedented change as the sector implemented the new global sulphur limit of 0.5% m/m, significantly reducing the amount of sulphur oxide ships release into the atmosphere. The regulation undoubtedly had a significant impact on the marine fuel supply chain with the introduction of new compliant fuel blends and alternative fuels.

Since the global sulphur cap there has been a notable rise in new varieties of alternative fuels entering the market.

PRIOR TO THE CHANGE, OIL MAJORS FRANTICALLY WORKED TO PRODUCE A SUFFICIENT SUPPLY OF LOW SULPHUR FUELS TO MEET DEMAND.

This was despite the challenge that the industry as a whole was not in agreement as to what the level of demand would be. In addition, concerns and questions remained over the stability and compatibility of the new blended and hybrid fuels, compared with Heavy Fuel Oil (HFO), and the potential impact on vessel operations urgently needing to be addressed.

Condition monitoring technology has evolved significantly over the last decade, moving on from the days of engineers physically examining equipment and relying on their senses and intuition. The proper application of the sophisticated online sensor technology available today can enable operators to plan maintenance requirements with the least possible impact on operational schedules and cost.



2020
AND A SEISMIC
SHIFT FOR
THE SHIPPING
INDUSTRY



INVEST IN IMO 2020

Measuring Sulphur Content in Marine Fuels - Parker Kittiwake
X-Ray Fluorescence (XRF) Analyser:

Accurate and reliable portable sulphur testing allows for a 'spot check' analysis of the sulphur content in fuel – providing shipowners and Port State Control (PSC) with easy access to the data they need to check and prove compliance with the regulation.

Traditional methods for confirming sulphur levels rely on paperwork requirements such as the Bunker Delivery Note (BDN). This not only significantly increases the risk of non-compliance and subsequent penalties for shipowners, but also heightens the environmental impact of burning fuel with a higher sulphur content. In addition, the delay incurred by laboratory analysis creates the risk that the vessel may have left port with non-compliant fuel onboard, or may require non-compliant fuel to be de-bunkered and compliant fuel re-bunkered, incurring significant delays and additional cost.

Find out more about our range of
condition monitoring solutions at
parkerkittiwake.com

ENSURING
COMPLIANCE &
ENFORCEMENT



SULPHUR TESTING RELIABILITY, REDUCING COST



XRF ANALYSER

The Parker Kittiwake XRF analyser provides on-site analysis of the sulphur content in fuel onboard a vessel, allowing shipowners and authorities to ascertain compliance almost instantly:

- Integrated into a small, lightweight housing, the XRF is easily portable for 'plug-and-play' operation, the XRF provides an accurate indication of sulphur content through the analysis of a small fuel sample in 3 minutes.
- The XRF Analyser is factory calibrated according to the ISO 8754 standard, and is capable of conducting field measurements that correlate strongly with laboratory measurements.
- Fuel can be easily sampled at any stage of the bunkering process, and test results can be stored electronically, allowing operators to manage compliance audits more efficiently.

In addition to measuring the sulphur content in fuel oils, the XRF Analyser can also be used to measure a range of wear metals in lubricating oil, allowing operators to quickly identify potential damage in cylinder liners, bearings, piston rings, gears, stern tubes and hydraulic systems.

- **XRF6111**



IMO 2020

The sulphur cap regulation had a significant impact on the marine fuel supply chain as new compliant fuels and alternative fuels entered the market.

Fuel quality has a direct impact on a vessel's performance, efficiency and maintenance costs, and so the testing of fuel samples for density, cat fines, flash point, viscosity, water and pour points is central to maintaining safe, efficient and cost effective operations.

With so many variables influencing fuel quality and the resulting impact on combustion and potential engine damage, the importance of taking a proactive approach to sampling and testing fuels and lubrication oils and creating a trend of data across a fleet of ships, has never been greater to protect vessel, crew, critical machinery and revenue streams.



MANAGING
MARINE FUEL
STABILITY AND
COMPATIBILITY



EARLY DETECTION OF CAT FINES

Catalytic fines, known as cat fines, are abrasive particles comprised of aluminium and silicon oxides. If cat fines are present in the fuel that enters engines, they can cause severe abrasive wear and create irreversible damage to a vessel's fuel system. When fuel is stored for extended periods of time, cat fines – leftovers from the refinery cracking process – settle out of the fuel and build up as sediment in storage tanks. If the tanks are not drained regularly, this sludge can enter the fuel system and cause substantial damage to fuel pumps, injectors, piston rings and cylinder liners – resulting in significant damage and costly repairs.

Proactively testing for the presence of cat fines, both in the fuel and in the system, can deliver significant cost savings and safeguard against potentially catastrophic damage.

Using a simple pre-mixed chemical bottle test, which detects the presence of cat fines in a representative sample of fuel oil, engineers are able to identify abrasive and potentially damaging particulates in the fuel oil before the oil enters the system, allowing them to take preventive action to avoid critical damage before it occurs.

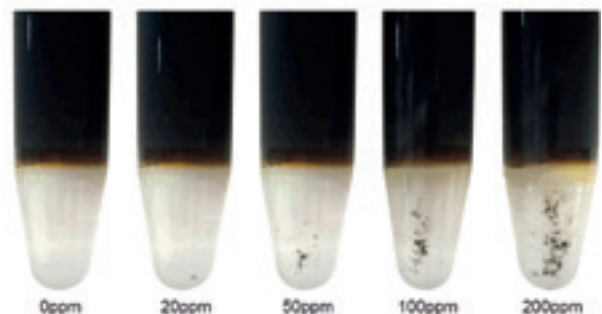
CAT FINES

The Cat Fines Test Kit detects catalytic fines to help prevent irreparable damage of fuel pumps, injectors, piston rings and liners.

- **FG-K30566-KW**



CATFINES SAMPLE VIALS





OPERATE WITH IMO 2020

Ensuring Fuel Stability Within Minutes
with Parker Kittiwake's Fuel Compatibility Tester



The stability of the fuel and its compatibility for blending is critical to protecting the operational efficiency of the engine. Vessels bunkering in different geographical locations will use varying fuel suppliers, and thus blending of fuels is inevitable.

Simple, onboard fuel compatibility testing switching is very simple and takes just minutes. It provides shipowners and engineers with the information they need to confirm that the fuel delivery will remain stable in the bunker tanks. Proactive testing of fuels will identify potential stability issues before the fuel is blended, negating the risks associated with blending incompatible fuels before costly damage occurs.





COMPATIBILITY TESTER

The Compatibility Tester identifies possible stability problems before blending two fuels, indicating the effectiveness of stability additives.

- **FG-K1-500-KW**



DENSITY METER

The Density Meter provides an on-site fuel analysis lab to help protect assets, improve productivity and increase up-time.

- **FG-K1-300-KW**



FERROUS WEAR METER +

The Ferrous Wear Meter (FWM) is an advanced instrument for measuring the abrasive iron content in oil samples, the FWM+ now includes std Grease Fe measurement.

- **FG-K30258-KW**

EXPLORE THE IMO 2020

As the shipping industry faces the challenges of escalating fuel costs and increasingly stringent environmental regulations, ship owners are favouring new generation engines, such as Mark 8.1 or newer, which offer improved fuel consumption.

By utilising longer piston strokes these newer engine designs achieve improved fuel oil consumption. However this process allows the cylinder walls to cool more than the older engine designs, allowing water to condense on the surfaces of the cylinder liners and react with the sulphur dioxide in the combustion gasses, leading to the formation of sulphuric acid and resulting in corrosion on the liner surface. The resulting iron compounds formed by this process are flushed into the cylinder oil, leading to excessive wear of the cylinder liner, the average replacement costs of which are \$150,000.

Operators can avoid costly repair bills with frequent testing which provides a comprehensive overview of conditions within the cylinder chamber, enabling them to address harmful levels of corrosive elements before they are able to cause damage. In order to prevent cold corrosion from causing preventable damage, shipowners must understand the underlying causes and limit - or if possible eradicate - the effects of corrosive wear, ensuring optimal operational efficiency and minimising costs.

Most commonly available condition monitoring tests indicate the total iron level, giving the combined level of both metallic and non-metallic compounds in the cylinder oil. However each of these elements have differing properties. Ship operators ideally need to monitor the levels of both metallic and non-metallic elements separately in order to understand where corrosive wear originates from and therefore take action to prevent it. This can be achieved through regular and efficient condition monitoring.

ADDRESSING COLD CORROSION



COLD CORROSION TEST KIT

The Cold Corrosion Test Kit (CCTK) provides an accurate measurement of corrosive iron content in cylinder liner oil.

- **FG-K19763-KW**

OPERATE WITH IMO 2020

It becomes ever more important to monitor the condition of cylinder oil as increasing numbers of engine manufacturers now advocate the use of higher base number (BN) lubricants in newer engine designs in order to minimise the issue of corrosion.

The scrape down oil is continually exposed to acidic combustion products that need to be neutralised before they corrode engine parts. Frequently testing the residual base number of used cylinder lubricant will prevent damage to engine parts by ensuring that alkaline reserve levels required to neutralise the acid are sufficient, preventing unnecessary corrosive damage to costly engine components such as cylinder liners.

The Parker Kittiwake DIGI Plus Cell is a state-of-the-art analysis tool that gives engineers a rapid indication of the levels of water in oil as well as an indication of the lubricant's residual BN. It's one of shipping's most popular test methods for onboard testing, providing fast, accurate results in real time, enabling easy monitoring of vital trends.



HIGHER BASE
NUMBER
LUBRICANTS &
CORROSION



DIGI PLUS CELL WATER & BN TEST KITS

The DIGI Plus Cell is the essential device for Water in Oil and BN (Base Number) testing.

- **FG-K6-108-KW+**



BUNKER SAMPLES, STORAGE SYSTEMS

A completely self-contained unit providing everything needed to comply with the collection, retention and storage of bunker fuel oil samples in accordance with IMO 2020 regulations.

- **FG-K16091-KW**



Heated Viscometer

Make fast on-site maintenance decisions with the Heated Viscometer, providing laboratory grade oil condition results in minutes.

- **FG-K1-200-KW**



LinerSCAN

LinerSCAN is the world's first real-time alarm system for cylinder liner wear, providing early warning against engine damage.

- **FG-K17400-KW**
- **FG-K17401-KW**



ATR Analyser

The Attenuated Total Reflectance (ATR) truly revolutionises on board testing as no reagents, chemical mixing or accurate sample sizes are needed. This is truly REAGENTLESS TESTING.

- **ATR1100**

Parker Worldwide

Europe, Middle East, Africa

AE – United Arab Emirates,

Dubai

Tel: +971 4 8127100

AT – Austria, St. Florian

Tel: +43 (0)7224 66201

AZ – Azerbaijan, Baku

Tel: +994 50 2233 458

BE/NL/LU – Benelux,

Hendrik Ido Ambacht

Tel: +31 (0)541 585 000

BY – Belarus, Minsk

Tel: +48 (0)22 573 24 00

CH – Switzerland, Etoy

Tel: +41 (0)21 821 87 00

CZ – Czech Republic,

Prague

Tel: +420 284 083 111

DE – Germany, Kaarst

Tel: +49 (0)2131 4016 0

DK – Denmark, Ballerup

Tel: +45 43 56 04 00

ES – Spain, Madrid

Tel: +34 902 330 001

FI – Finland, Vantaa

Tel: +358 (0)20 753 2500

FR – France, Contamine s/Arve

Tel: +33 (0)4 50 25 80 25

GR – Greece

Tel: +30 69 44 52 78 25

HU – Hungary, Budaörs

Tel: +36 23 885 470

IE – Ireland, Dublin

Tel: +353 (0)1 466 6370

IL – Israel

Tel: +39 02 45 19 21

IT – Italy, Corsico (MI)

Tel: +39 02 45 19 21

KZ – Kazakhstan, Almaty

Tel: +7 7273 561 000

NO – Norway, Asker

Tel: +47 66 75 34 00

PL – Poland, Warsaw

Tel: +48 (0)22 573 24 00

PT – Portugal

Tel: +351 22 999 7360

RO – Romania, Bucharest

Tel: +40 21 252 1382

RU – Russia, Moscow

Tel: +7 495 645-2156

SE – Sweden, Borås

Tel: +46 (0)8 59 79 50 00

SL – Slovenia, Novo Mesto

Tel: +386 7 337 6650

TR – Turkey, Istanbul

Tel: +90 216 4997081

UK – United Kingdom, Warwick

Tel: +44 (0)1926 317 878

ZA – South Africa, Kempton Park

Tel: +27 (0)11 961 0700

North America

CA – Canada, Milton, Ontario

Tel: +1 905 693 3000

US – USA, Cleveland

Tel: +1 216 896 3000

Asia Pacific

AU – Australia, Castle Hill

Tel: +61 (0)2-9634 7777

CN – China, Shanghai

Tel: +86 21 2899 5000

HK – Hong Kong

Tel: +852 2428 8008

IN – India, Mumbai

Tel: +91 22 6513 7081-85

JP – Japan, Tokyo

Tel: +81 (0)3 6408 3901

KR – South Korea, Seoul

Tel: +82 2 559 0400

MY – Malaysia, Shah Alam

Tel: +60 3 7849 0800

NZ – New Zealand, Mt Wellington

Tel: +64 9 574 1744

SG – Singapore

Tel: +65 6887 6300

TH – Thailand, Bangkok

Tel: +662 186 7000

TW – Taiwan, Taipei

Tel: +886 2 2298 8987

South America

AR – Argentina, Buenos Aires

Tel: +54 3327 44 4129

BR – Brazil, Sao Jose dos Campos

Tel: +55 080 0727 5374

CL – Chile, Santiago

Tel: +56 22 303 9640

MX – Mexico, Toluca

Tel: +52 72 2275 4200



EMEA Product Information Centre

Free phone: 00 800 27 27 5374

(from AT, BE, CH, CZ, DE, DK, EE, ES, FI, FR, IE, IL, IS, IT, LU, MT, NL, NO, PL, PT, RU, SE, SK, UK, ZA)

US Product Information Centre

Toll-free number: 1-800-27 27 537

www.parker.com