



EASY KIT FOR MEASURING IRON POWDER IN CYLINDER OIL DRAIN

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I Introduction

As marine diesel engine output increases, the combustion chamber will be put under ever more strain. Recently, the contamination of Bunker Fuel Oil by FCC has seriously damaged moving parts and such wear and tear has reportedly affected the safe navigation of ships.

In order to know the wear and tear of moving parts within the combustion chamber, inspection and maintenance are carried out at anchorage; if wear and tear could be studied on board at sea, such data could improve engine operation and help to prevent engine troubles. No such apparatus has been available up to now, however.

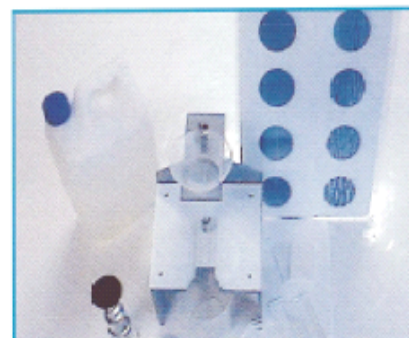
Mitsui O.S.K. Lines has found, as a result of the continuous monitoring and analysis of cylinder oil drain from large-output marine diesel engines, that analyzing such data will allow the continuous monitoring of the wear and tear of moving parts. Consequently, a reduction in the amount of cylinder oil used will contribute to cutting costs.

During the monitoring process, we tried in various ways to invent a kit which enables the easy measurement on board of the concentration of iron powder within cylinder oil drain. We have been successful in developing such a kit using a magnet. We sincerely hope that the use of this kit for monitoring wear and tear will secure the safe navigation of ships.

In addition, to support the effective use of this kit, we also provide a regular sample-checking service (with a charge) at our laboratory in Tokyo. We believe that this kit may also be used for monitoring the concentration of iron powder in actuating oil.

II Kit details (composition)

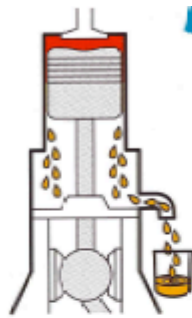
- ① Main body of the measurement kit (with a funnel positioner)
- ② Plastic funnel ③ Slide glass ④ Skid-proof silicon sheet
- ⑤ Magnet for collecting iron powder
- ⑥ Beaker for dilution (vol. 100ml) ⑦ Stirrer bar
- ⑧ Plastic beaker for collecting the sample oil (vol. 200ml)
- ⑨ Magnifying glass ($\times 10$)
- ⑩ Sample photos for comparison (enlarged, $\times 10$ & $\times 100$)
- ⑪ Solvent for dilution of sample oil (Shell's Paraol130)
- ⑫ Microscope for viewing sample oil ($\times 100$, optional)





Method for measurement

1) Sampling of cylinder drain



2) Shaking of the

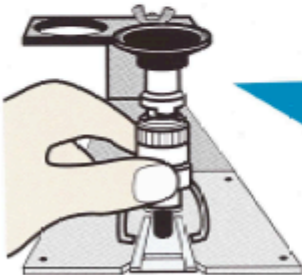


3) Pouring drain sample into

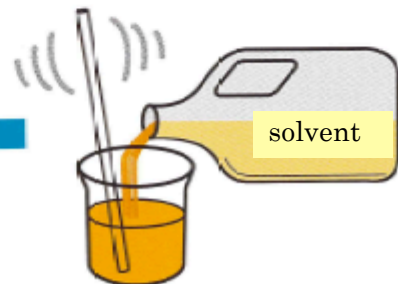
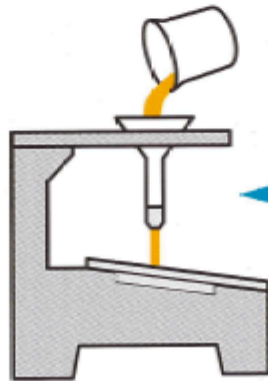


6) Removing carbon residue

5) Sample into funnel



4) Diluting sample with solvent



****CAUTION****

Removing the slide glass③ from the kit may cause a disorderly arrangement of the iron powder on it and make estimating concentration levels difficult; observe the slide glass on the kit.

IV Notes

- 1) It is essential that iron powder is evenly dispersed in the sample oil. Therefore, it is best to take a sample just before measurement.
- 2) Thoroughly clean and dry the plastic funnel②, slide glass③, beaker⑥ and stirrer bar⑦ with a neutral detergent.
- 3) The slide glass is rimmed with a silicon sheet④ to stop it from slipping. This sheet may expand with the organic solvent or solvent in the sample dilution. In such cases, immediately clean it with a neutral detergent, water it down, then dry it (it may deteriorate if left contaminated a long time).

- 4) The solvent for sample dilution①, which includes the oil product (Shell Paraol 130), must be kept away from fire and must not be easily accessible. (For details kindly refer to the enclosed data sheet).

For your inquiry, please contact:

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