

## CASE STUDY

# Carbon Contaminated Dark Gas Oil



T: +44 (0) 1256 704000  
enquiries@spectro-oil.com  
www.spectro-oil.com

CONDITION MONITORING EXCELLENCE

## Brand new yacht dark gas oil found to be carbon contaminated.

### INTRODUCTION

During delivery trials of a new yacht, it was found that several fuel filters were becoming choked. On site examination of the filters found a dark grey to black, tar like deposit adhering to the upstream side of the filters. Samples of the fuel were taken from different storage tanks and from system pipes. A theory was that the system lubricating oil was contaminating the fuel. Spectro was contacted and filters, fuel and lubricant samples were forwarded to the laboratory.

### ANALYSIS

Visual inspection of the various fuel samples showed some dark discoloration untypical for marine gas oil. Visual inspection of the fuel filters showed a thick black fluid deposit. Spectrographic analysis of the fuel samples indicated no presence of lubricant additives. Lubricating oil samples were tested for Flash Point to show any possibility of fuel/lubricant crossover – results were satisfactory. Different fuel samples were tested for microbacteria contamination – results were negative. Fuel samples were tested for Micro Carbon Residue (MCR) all of which were typical for marine gas oil. The black fluid deposit from the fuel filter was tested for MCR and gave a result of over five percent. Further analysis of the black fluid deposit in the filter using Scanning Electron Microscope (SEM) produced a deposit of over 300mg consisting of very fine particles below 10 microns.

### ACTION/FOLLOW UP

Initial results were discussed with the customer and further analysis agreed. The customer proceeded to pump ashore all fuel and clean the entire system. Further samples were taken which showed black thick fuel towards the bottom of each storage tank. On shaking these fuel samples, the fine black substance could be seen to settle out over a short period of time.

### CONCLUSION

Marine gas oil should be clear, bright and usually colour tinged. It should also be free from visible debris. There is virtually no Carbon Residue in marine gas oil. Finding over five percent MCR in the residue from one of the fuel filters, together with the fine carbon flushed from the filter tested in the SEM confirmed an external contamination of the fuel by fine carbon.

