



# Solution awareness in fuels

Taking the guesswork out of managing microbial risk

**Amendments to environmental legislation are changing the nature of diesel fuel and increasing the risk of microbial contamination. As a result, those involved in its production, distribution and use are finding that they need to change, or at least review, the way they manage their operations to maintain fuel quality.**

The combination of biofuel introduction and reduction in sulphur content has had a negative impact on fuel integrity. These unintended consequences include lubricity challenges and the threat of microbiological contamination. It has proved relatively easy to find solutions to the lubricity issues but dealing with diesel bug is a much more complex nut to crack.

The old adage of 'remove the water and minimise the diesel bug' is as true today as it ever was. However, it is much more difficult to remove water effectively from diesel containing biofuel. Fatty acid methyl esters (FAME) the compounds making up biofuel are extremely hygroscopic which means biofuels absorb and hold on to water to a greater degree than traditional mineral diesel. In fuel containing FAME, free water can usually be found, as expected, at the bottom of a tank, but above this free water there is often a hazy layer of suspended water. Whilst this hazy fuel can still be drained away, water droplets which can be dispersed throughout the fuel are more difficult to deal with. At each and every water-fuel interface, bugs will live in the water whilst they feed on the fuel.

Removing the water completely therefore is becoming more of a challenge; increasing the risk of diesel bug and creating an operational threat of equipment failure. Prolonged, heavy contamination is an expensive affair. It can cause corrosion and requires expensive mechanical intervention and significant downtime to clean the tank.

The fuel system and the fuel will also require both polishing and biocide treatment. Even at moderate levels of contamination filter blockage, pump and injector wear plus metering and gauging issues cause costly operational issues. Here just biocide and or fuel polishing should be sufficient. The majority of operators have concluded that detecting and dealing with the problem early is the efficient, cost-effective answer. In other words; a proactive approach.

A risk-based fuel maintenance regime should begin with testing to gauge the levels of diesel-bug in the system and there are several different types of test available. There are pros and cons with each method with regards to the time taken to obtain results, the cost, the equipment, safe disposal and expertise required to conduct the test. The choice of test will depend on the nature of the operation and the requirements of the engineer. On-site testing puts the operational team in control and delivers immediate actionable information. Pregnancy style, action and alert level based FUELSTAT® PLUS from Conidia is the quickest easiest zero investment on site choice. ATP testing is a popular choice where the investment required for a reader may be justified by high volumes of testing. Colony counting methodologies are ideal where time is not of the essence and full quantification may be required. On-site testing also means that operators can test fuel at the point of uploading to ensure that they are not accepting moderately or heavily contaminated fuel. Unfortunately bugs are everywhere and no fuel is bug-free once it leaves the sterile refinery environment.

In summary, water management and microbial testing are the essential tools operators need to maintain fuel quality.