



INFORMATION SHEET 1 - FUELSTAT[®] *resinae* PLUS Test Kit

(Previously called Kerosene Advanced)

Hormoconis resinae, other fungi and bacteria in Aviation Kerosene

Microorganisms can grow in certain fuels by using the alkanes present as a foodstuff. In some cases they may be able to utilise some of the additives in the fuel. Mid-to-light distillate fuels are particularly susceptible to contamination by micro-organisms.

The type of organisms and the damage inflicted depend on the fuel and the additives. All contamination is important when considering the quality of a fuel and particularly when monitoring stored products and reserves. However, whilst a wide range of microorganisms can be found in fuels in aircraft tanks and, if left unchecked can cause damage to the tanks, the most serious organism is the filamentous fungus, *Hormoconis resinae* (*H.res*). It is present in about 96% - 97% of all cases of contamination found in fuel. The other small percentage of cases is made up solely of bacteria and other fungi, including some yeasts. However, *H.res* is the most damaging of all contaminants for a number of reasons.

Firstly, its size and bulk. When compared to single cell yeasts and bacteria *H.res* produces far more biomass and is thus more likely to cause blockage problems.

Secondly, it is by far the most common cause of microbial corrosion in aircraft tanks. Other organisms are more important in other circumstances, for example, in some ship fuels and in long term storage. The other important corrosive organisms are the anaerobic bacteria, collectively known as Sulphate reducing bacteria (SRB) or, more accurately, sulphide generating bacteria (SGB). These are not common in aircraft wing tanks because of the high levels of aeration produced during flight and refuelling. Other filamentous fungi may be emerging as important, but these tend not to occur without *H.res* being present and, in any case, are not currently very common.

Thirdly, because of the way *H.res* grows between fuel and water, it usually starts on small water droplets. It then covers the droplet, holding it in place, and continues its growth, actually generating more water under the mat due to its metabolism. In the process, it firmly attaches itself to the tank.

Bacteria and yeasts tend to require free water and are found mainly floating in the water phase. This means they are less likely to adhere to surfaces and will therefore be significantly reduced at each water drain. *H.res*, once established, continues to multiply in situ.

In aircraft, high levels of bacteria and yeasts tend to indicate that you have picked up poor quality fuel and, as such, are useful indicators. However, this does not necessarily mean that they are causing any problem in the tank and they will probably be significantly reduced at the next drain. High levels of *H.res*, however, indicate that there is potentially a serious problem in the tank. While *H.res* continues to be an excellent indicator of contamination, some of our customers have requested a test kit which tells the whole story by detecting bacteria, yeasts and other fungi in the fuel

Currently available fuel tests involving total microbial counts simply tell us that there are microorganisms present in the fuel and that they are alive. Conidia Bioscience's new **FUELSTAT[®] *resinae* PLUS test kit** goes beyond this. It detects **active** *H.res*, bacteria and other fungi and tells us not only that contamination is present and alive but also that it is growing and therefore the potential for damage is real. **The FUELSTAT[®] *resinae* PLUS test kit** test measures the amount of active growth in the sample and provides action and alert levels.