

# FUEL TESTING



Fuel Sampling Kit - FSP



Biodiesel % Analyser - Part of FST



Microbe Analysis - Part of FST

DIESEL

B100

HEATING OIL

KEROSENE

## TEST FOR MICROBIAL CONTAMINATION AND BIODIESEL LEVELS

# HYTEK

FUEL SAMPLE TEST REPORT

Report no:	FSR1234	Report date:		Tank no:	1	Fuel type:	DERV
Customer:	HYTEK CUSTOMER NAME			Site:	COMPANY		
Contact:	CUSTOMER CONTACT NAME			Location:	TOWN		

Serial no:	Sample location				Sample date:	Test date:	cATP reading pg/mL	Biodiesel %	Free Water (Y/N)	Warning level:	
1234	Nozzle *	✓	Other *	Tank Bottom		02/01/2013	03/01/2013	52.10	5.9	N	MEDIUM
	Nozzle *		Other *	Tank Bottom							
	Nozzle *		Other *	Tank Bottom							

\* Samples taken from outside of the storage tank may not show an accurate representation of microbial contamination level inside the storage tank

### Microbial Contamination Warning Level

Results are based on volumes of Adenosine Triphosphate (cATP)<sup>1</sup> measure in pg/mL<sup>2</sup> found in a typical cell. This allows us to calculate the microbial contamination level within the fuel sample.

Low Contamination	(Less than)	< 10 pg/mL	No obvious effects
Medium Contamination	(Between)	10 < 100 pg/mL	Possibility of effects
High Contamination	(Greater than)	> 100 pg/mL	Severe effects likely

### Microbial Effects

When microbial contamination increases microbes begin to communicate with each other form colony forming units (CFU's). CFU's will block tank, pump and vehicle filters causing an increase in frequency of filter replacements, slow flowrates will result from blocked filters meaning increased filling time, and slower throughput of vehicles costing money. Microbial contamination can cause damage to tanks / pipework and other equipment and may result in vehicle downtime with costly repair bills and loss of productivity. Microbial contamination can also result in the degradation of the quality of your fuel causing vehicle and equipment failure.

### Biodiesel Level

The current standards for Gas Oil BS2869 and Road Diesel BSEN590 allow for the inclusion of up to 7% bio-diesel. Biodiesel is hygroscopic (absorbs water) and contains FAME (Fatty Acid Methyl Esters). Water and FAME provide ideal conditions for microbial growth. Biodiesel also provides detergent type effects, cleaning tank internals and pipework, this may result in filter blocking. High biodiesel concentrations absorb more water and promote faster microbial growth, seals and other equipment may be damaged if compatibility with bio-diesel is not checked.

### Recommendations

Contamination to be removed from the tank and the tank cleaned if required.	Routinely test tank for water and microbial contamination (every 6 months).	✓
Fuel should be tested before being used to check it is within current specification.	Regularly test tank for water and microbial contamination until contamination level reduces (every 3 months).	✓
Fuel should be cleaned before being used, this may involve filtering and/or additives.	Fit a water soaker / tank dryer and routinely check (every month) for water absorption and replace when required.	✓
Fit a particle / water and particle filter (as suitable) to the tank or dispenser outlet to prevent contamination from entering equipment.	Check tank lid / fittings for tightness ensuring they will not allow the possible ingress of water.	✓
Consider fitting a fuel conditioner to reduce effects of microbial contamination.	Consider fitting a tank re-circulation kit to keep water / particulate and microbial activity within the storage tank to a low level.	✓

## Why Do I Need To Test My Fuel?

Road diesel & gasoil can now contain a percentage of bio-fuel (up to 7%) this provides an ideal breeding ground for diesel/gasoil bugs.

- Equipment is failing due to bugs in these modern fuels. Problems with contaminated fuel inside storage tanks is causing pump &/or vehicle filters to block. In severe cases vehicles have stopped causing downtime & hefty repair bills.
- These issues are caused by microbial contamination (often known as diesel bugs which are micro-organisms that grow on water present in fuel). This problem has been known but contained for years until the age of the latest fuels.
- A tank becomes an incubator as the variation of temperature, condensation & now the added percentage of bio-fuel (which attracts water as it is hygroscopic) helps these bugs to flourish.
- Over a period of time living microbes grow into large colony forming units (CFUs) which get sucked into fuel supply lines blocking filters on dispensing pumps & vehicles. Microbial contamination is most commonly seen as sludge that forms in the bottom of storage tanks & accumulates on filters. This sludge also contributes to poor emissions (seen as black exhaust smoke).
- In addition to this even fuel with a small percentage of bio-fuel will act as a detergent cleaning the inside of the storage tank, pipework & valves allowing a dirt & sludge to be sucked up by pumps blocking filters.

## Fuel Testing For Microbes

Testing for microbial contamination in diesel & gasoil gives people storing fuel a warning so that they may prevent microbial contamination reaching dangerous levels. This would will cause problems to the fuel & equipment therefore testing before it happens prevents vehicle & equipment downtime & expensive repair bills.

Our test measures the total quantity of microbiological activity through a single analysis within minutes. The test report gives you a traffic light warning sequence:

- Green = Low contamination, no preventive action is required < 10pg/ml
- Amber = Medium contamination, preventative action is required 10 < 100pg/ml
- Red = High contamination, preventive/remedial action is required > 100 pg/ml

## Tank Hygiene Is Important And Is An Ongoing Requirement

Ask your fuel/tank/pump supplier/maintenance company to:

- Regularly check for the presence of water.
- Bottom out your tank to remove any free water & sludge.
- Fit a fuel conditioner to your suction & vehicle fuel lines.
- Inspect your tank, checking for points of water ingress.
- Have your fuel tested regularly for microbes.

Stk Code	Description
<b>FSP</b>	Fuel sampling kit
<b>FST</b>	Fuel test & report

### Supplied by:

