FPS

Driving Oil Distribution Forward

In association with

TankCare™

A Division of OTS

The Benchmark for Fuel Cleanliness

The quality of Bio diesel deteriorates very quickly during storage unless special measures are taken to remove water content and prevent the build up of microbial contamination. OTS TankCare has been formed to provide the support required to ensure that fuel storage facilities are checked and equipped to deliver an optimum level of quality.

TankCare™ is a division of Oil Tank Supplies focussed on maintenance support of fuel storage facilities. The efficient operation of all powered plant and machinery depends on the fuel quality. We aim to ensure that your fuel storage facilities are able to sustain an optimum level of quality from delivery through to dispensing.

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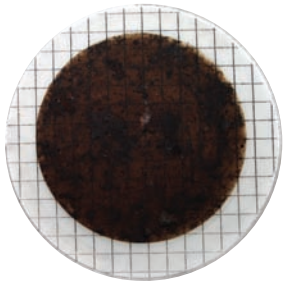
Whatever the requirement, whether you're a fuel provider, Fuel retailer, Haulier, Farmer, Commercial or Domestic fuel user, TankCare™ can provide the knowledge and resources required to deliver the necessary planning information, analysis and maintenance solutions to care for your entire fuel storage installation, including any associated equipment such as trucks and generators etc.

Fuel Sampling



Frequent sampling is crucial for maintaining fuel condition. Deterioration starts from the time the fuel has been processed and the first signs can be detected at the bottom of the storage tank, where most of the debris and water accumulates.

Frequent testing will determine fuel degradation, water content, particulate levels (Cleanliness) as well as identifying the presence of Diesel-Bugs. Under typical environmental conditions fuel degrades at 2.56 grams per litre per day. As the microbial contamination takes hold this rate increases to 5.4g per litre per day.

Many Petroleum companies recommend a time limit of six months for storing biodiesel. Current industry recommendations state that stocks of biodiesel of over six months should be checked to ensure it meets specifications. This reanalysing procedure is important for cases where the fuel storage is for a critical backup resource such as an emergency power generator system.

TankCare is considered to be one of the industry leaders for measurement and qualification procedures. Not only do we carry out our testing on site (unless you send samples to us) our process is recognised as being the most complete testing services in the market.

Currently we test for the three most recognised types of contamination:

- **Bacterial Contamination**
- **Water Contamination**
- **Particulate Contamination**

It should be noted that the accuracy of each test is dependent on the time elapsed between taking the sample and analysis. The bacteria within the sample begin to die as soon as it's exposed to daylight (UV). After 48hrs, most if not all bacteria will be dead and therefore testing at this time would be pointless.

Temperature also plays a significant part, at certain levels the bacteria can accelerate growth or indeed react in the opposite way depending on the type. The same can be stated about certain test types. It is therefore essential to be certain that the type of test you buy or employ will be effective at various ambient temperature levels. This is not the case with the testing process used by TankCare™.

TankCare™ ATP - Bacterial Test System

ATP testing has been used for detecting microbial activity in a variety of fluids for many years in the medical and food production professions. Basically this procedure provides a cell count - and does so for ALL types of living organisms in a single test which is conducted on site.

ACCURATE TESTING AND CERTIFICATION

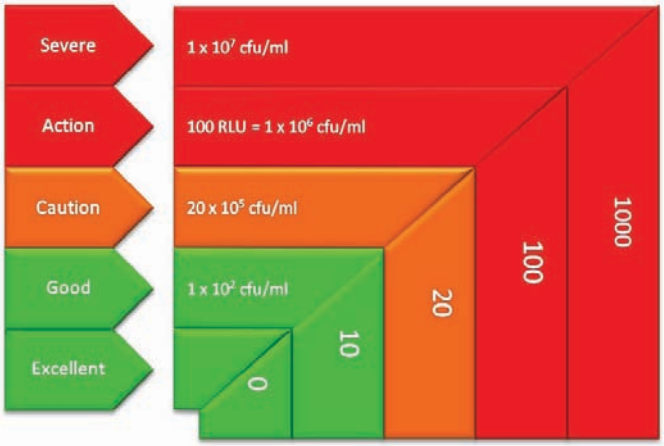
ATP testing is the ideal test for measuring microbial contamination and, by extension, it is also the fastest, most accurate AND least expensive method for monitoring and controlling microbial activity.

The procedure has the ability to detect as little as one living cell per millilitre and 85% accuracy therby allowing us to track and predict, potential risk and certify the fuel as safe.

WHAT IS ATP?

- **ATP is made 'on-demand' as it is 'the energy' molecule in a cell**
- **Is quickly produced and quickly disappears from the cell**
- **ATP is only present when the cell is using or transferring energy so it measures viable activity only**
- **Dead cells contain no significant levels of atp so it is a waste of test kit money to do free atp testing**
- **ATP levels change with the life-cycle of the cell so the correlation with diplsides is not recommended**
- **ATP levels can aproximate the nubmer of cells under some conditions**
- **Not specific to any microbial type**
- **Atp determines the presence of cells at low levels**
- **ATP is very sensitive and can detect 1 cell per ml**

INTERPRETATION OF RESULTS



Quite simply we work on a traffic light system:
GREEN = OK, AMBER = CAUTION, RED = ACTION

TankCare™ (Water Moisture Test – PPM (Parts per Million))

Our test method allows us to test for both free water, and suspended water. Water in suspension of biofuels has increased from around 200ppm (conventional road diesel), to 500ppm for biodiesel, higher as the % of FAME increases. Dependent upon the percentage of bio-fuel? will depend upon the result you receive, however to simplify the result we have again reverted to the traffic light system:

GREEN (OK) = 0PPM – 500PPM

AMBER (Caution) = 501PPM – 1000PPM

RED (Action) = 1001PPM – Upwards

Since water is vital to support life in the bacteria (use oxygen from the water), even if you don't have bacterial contamination it's best to remove the potential habitat.

TankCare™ (Particulate Test (Cleanliness) ISO 4406 – 1999)

It's important to understand how clean the ur fuel is, not just how contaminated it is with bugs or water. Particulates within fuel accounts for more damage to plant and machinery than bacterial contamination ever will. The worldwide fuel charter does call for 18/16/13 code and some engine manufacturers have called for the cleanliness to be as low as 12/9/6 on some fuel systems. This is probably why engine manufacturers developed ISO 4406 code.
ISO 4406 – What does it mean?

ISO 4406 - What does it mean?

- **Defines the level of contamination present in a fluid sample (1 ml)**
- **Gives the overall contamination level an ISO rating**
- **Three scale numbers are used, all particles greater than or equal to 4,6 and 14 micron in size**

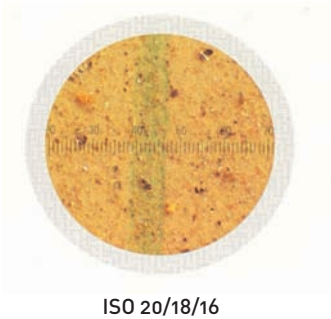
For instance, if a given sample of 1ml has:

- **15,000 particles larger than 4 microns, the 4m CC will be 21**
- **2,000 particles larger than 6 microns, the 6m CC will be 18**
- **240 particles larger than 14 microns, the 14m CC will be 15**

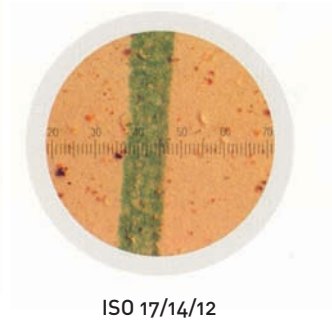
The code will be written as **21/18/15**

ISO code	More than	Up to
8	1	2
9	2	5
10	5	10
11	10	20
12	20	40
13	40	80
14	80	160
15	160	320
16	320	640
17	640	1300
18	1300	2500
19	2500	5000
20	5000	10000
21	10000	20000
22	20000	40000
23	40000	80000
24	80000	160000

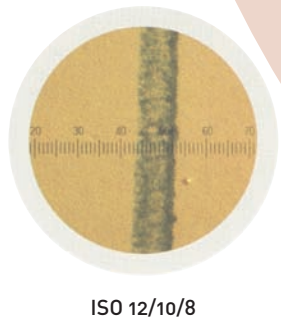
Examples of patches indicating Fluid Cleanliness



ISO 20/18/16



ISO 17/14/12



ISO 12/10/8

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