Protocol for Field Testing of Gasoline from Steel Drums and Race Cars for the Purpose of Assuring Compliance with General Competition Rules or Technical Standards Imposed by Sanctioning Bodies for Pro or Amateur Events

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PURPOSE

This compliance protocol is created in order to compare gasoline samples to one another and verify that they fall within expected criteria and specifications for a particular fuel (The Control Fuel). This is a commonly used paradigm to test specific gravity or density of an unknown liquid which in turn gives a clue to the content of the substance.

APPARATUS REQUIRED [i]

- Sealed containers (HDPE or glass) capable of storing hazardous chemicals in sufficient number and quantity to hold the sampled product for testing

- 1 hydrometer jar/cylinder (500mL) [PN: 141805]

- 1 hydrometer with specific gravity markings (optional thermometer) [PN: GW2535C] the specific gravity markings should be from below the known sample gravity to above the gravity, for example, 0.5 to 1.0 will be fine to measure most gasoline products.

- 1 siphon/pump/thief or other equipment required to pull samples from containers or vehicle fuel tank

PROCEDURE

1.) obtain the control variable(s) by taking a sample (<500mL, or 17oz) from a random unopened drum or drums using the siphon and place it into one of the sealed containers. Depending on the scope of the testing, a sample will need to be taken from each different type of fuel and from a representative number of containers to represent the control. We suggest one sample from every 5-10 containers. These samples will be the standard to which the other fuels in the test will be compared. All samples contained in the sealed containers must be marked for date, time and location of the sample and should be kept out of direct sunlight and in a climate-controlled environment.

2.) extract fuel from the test subjects (vehicles) by using the siphon. If there are different types of fuel in the experiment, use a different siphon for each fuel or thoroughly clean the siphon if the same one must be used for the entirety of the experiment. Avoid mixing of the fuels to any degree. Set aside the marked

test samples and store in a climate-controlled environment and out of direct sunlight until testing ensues. Make certain to replace fuel caps back onto their respective tanks after each sample is gathered. It is recommended that the fuel filler caps be marked with sealing tape to indicate a sample has been withdrawn in the case that any protests are filed and more samples need to be gathered. Note, all fuel samples will be sampled and tested at the same time.

3.) the test will be comprised of placing a sample of fuel into a hydrometer jar. The amount of the fuel in the jar should be sufficient to "float"[ii] the hydrometer and may require some trials to determine the correct amount of sample to place into the jar or cylinder. Place a hydrometer into the jar or cylinder and give the hydrometer a gentle twist to spin the appliance so that it can find its level in the jar. When the hydrometer settles then read the temperature and specific gravity readouts at the bottom of the meniscus[iii]. This will be repeated for each control and test sample. If different fuels are used in this test, then either use different hydrometer jars or thoroughly clean the existing one before reusing.

4.) upon testing, record temperature, specific gravity, the color of the fuels and the clarity, and the subject the fuel came out of. The same fuel found in all subjects should not differ vastly from their respective control, I.E. all cars running Radical 93 should not differ vastly in specifications to the control sample of Radical 93 taken beforehand. With water having a specific gravity of 1.00, we can expect the S.G. for these fuels to fall anywhere between 0.78 to 0.65 based on temperature

5.) once all testing has been completed, replace the fuel back to their respective containers from where they were originally taken out from or properly dispose of the samples.

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[i] Part numbers courtesy of the Lab Depot

[ii] Float the hydrometer refers to the level of liquid that will keep the hydrometer from touching the bottom of the jar or cylinder.

[iii] A meniscus is a curvature in liquid, and usually happens in vessels like test tubes.