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Water Suspension Demonstration – Suggested Procedures

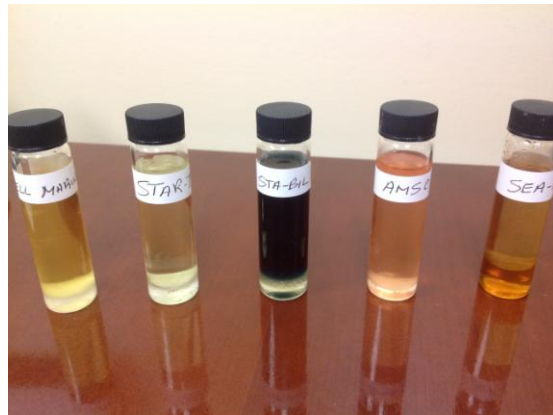
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Bell Performance formulates numerous single- and multi-function fuel treatments to control, absorb and/or disperse water in fuel. Water control is an important aspect of proper fuel housekeeping, helping to prevent or minimize the chances of costly problems developing in the future, including microbial growth and breakdown of fuel quality.

The following test procedures may be conducted with any fuel treatment, and may be done comparatively with two or more products to demonstrate the difference in ability to control water in fuel.

Materials Needed

- Fuel additive samples – Dee-Zol, Marine Dee-Zol, Mix-I-Go, Ethanol Defense, DFS Plus, plus other competitive products for comparison
- Glass vials with screw top: 6-dram (22 ml) size is optimal, but any size may be used
- Eye dropper or pipet
- Measuring cylinder (optional)



Procedures

The procedures of the test will involve filling one or more vials with fuel treatment(s), followed by the addition of water. The closed vials are then agitated to allow the fuel treatment(s) to work on absorbing or dispersing the water in the vial. A visual comparison may then be made on how well each fuel treatment disperses the water in the vial.

1. Measure enough additive to fill each vial to about two-thirds capacity. A 6-dram vial will hold 22 ml of liquid, so about 15 ml of additive is an optimal volume to start with. For



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best accuracy, use a measuring cylinder or unit. Depending on the audience, you may wish to show them you are doing this, to ensure the test results are accurate and viable.

2. Using the dropper or pipet, measure the same amount of water into each filled vial. 1-2 ml of water should be sufficient.
 - a. The number of drops needed to reach this volume depends on the dropper or pipet; you may wish to calibrate this number beforehand so you can count drops during your test demonstration.
 - b. Having the same amount of water and additive in each vial is important to ensure accuracy of the demonstration.
 - c. The percentage water of the total liquid volume will be 6-12%, which is much higher than typically encountered in real life.
3. Screw the cap on each vial to close the vial. Don't forget to do this, for obvious reasons.
4. Shake moderately or agitate each vial and set them down to observe the results.
5. Offer concluding comments.

Typical Results

You will likely observe one of several results after completing step four.

1. The additive will become milky while some of the water settles back to the bottom of the vial. This is typically what happens with Dee-Zol and Mix-I-Go. The milky or cloudy appearances indicates that a portion of the water has become attached to the additive's surfactant.
 - a. With Dee-Zol and Mix-I-Go, you should be able to observe extremely small droplets, suspended in the fuel. These are large micelles of water. At the same time, there will be much smaller micelles of water that you cannot see.





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2. Ethanol Defense and DFS Plus may appear to completely absorb the water, such that it will completely disappear.
3. Some additives like Amsoil will appear to have no effect on controlling water, as the water will behave as in a water-oil mixture – i.e. none of it will disperse.



Suggested Points to be Made

You may wish to incorporate some of the following points in your discussion during the demonstration.

1. Because the proportion of water is much larger than that typically encountered in real life, it is not expected that any of the additives will pick up all of the water in the vial. So these tests are qualitative demonstrations, to allow the audience to visually compare how different fuel treatments deal with water.
2. When the Bell additives are used in vehicles, normal fuel agitation in the fuel tank will allow a continual pickup of more water as the vehicle or machinery is operated.