# Technical bulletin

## Water Finding Pastes for Gasoline - Ethanol Blends (E10)

### Phase Separation

Because of the very low solubility of water in hydrocarbons, gasoline that is not blended with ethanol does not absorb significant amounts of water. When free water exists in an underground storage tank (UST) containing non-ethanol gasoline, it will typically not cause problems because it remains at the bottom of the tank and well below the suction of the submersible pump.

However, water can lead to more serious problems for tanks containing a gasoline-ethanol blend (E10). Ethanol is very soluble in water and even relatively small amounts of water can lead to a phenomenon known as phase separation. The excess water strips much of the ethanol from the E10 blend and a water-ethanol layer forms on the bottom of the tank. If this layer of water and ethanol in the bottom of the tank is large enough to reach the suction of the submersible pump, it could be dispensed to a vehicle and cause poor operation and stalling.

### Water Finding Pastes for E10 Blends

The occurrence of phase separations can be minimized by preventing water contamination downstream of the terminal. Early identification of a water problem is important. Although automatic tank gauging systems are useful in detecting water in a UST containing non-ethanol gasoline, most systems were designed for use in straight hydrocarbon gasoline and may not be as accurate with E10 blends. If the ethanol concentration of the phase separation layer is too high, the water float may not detect it. Reliance on the automatic gauging system may result in overlooking the presence of water in the UST.

Products known as water finding pastes may also be used to identify and quantify the presence of water in a UST. This is especially helpful just prior to a fuel drop.

### Using Gasoila AP Paste

BP has conducted certain laboratory and field tests on a variety of water finding paste and has found that Gasoila All Purpose (AP) Water Finding Paste seemed most effective at water detection. (In BP's testing, other pastes appeared to be less responsive in high humidity and temperature applications at times requiring 15 minutes submersion in the UST in order to react and change colors. BP tests also found some instances of "false positive" (i.e., paste indicates one consistent layer rather than two) when the water-ethanol bottom phase contains more than 70 vol% ethanol.)

A few instructions on the Gasoila All Purpose (AP) Water Finding product are summarized below:

• Smear the paste evenly on the bottom several inches of the tank gauging stick.

• Submerge the stick/paste in the tank for 10 seconds for a complete reaction and color change. Do not leave in longer or a false reading may occur.

• Read the water paste color change within 5 seconds of withdrawal. Leaving the paste in the fuel longer than 10 seconds or reading it after 5 seconds invalidates the reading and it must be redone.

• If the paste remains brown after sticking the tank, no water is present in the tank. Please refer to following chart to determine the presence or absence of water and water/ethanol bottoms.

For the most current user information and SDS, please contact Gasoila Chemicals at +1.216.464.6440 or on the web at http://www.gasoila.com.

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