Ethanol Fuel Blends Require Good Housekeeping?

Wayne Geyer
Steel Tank Institute

On behalf of the American Petroleum Institute, Al Jessel, senior fuels policy advisor for Chevron Products Co., spoke to Steel Tank Institute members at a recent meeting. He and Lew Gibbs, senior consulting engineer of Chevron's Fuels Technology Team, provided STI with useful information about the importance of good housekeeping with new fuels.

- Pump out tank bottoms. If water is left in the tank bottom, phase separation can occur when the ethanol blend enters the service-station tank. With phase separation, an ethanol-water solution settles to the tank bottom. Depending on the amount of water present and the location of the pump suction near the tank bottom, the ethanol-water solution may or may not be delivered to the customer. An engine will not run properly if this solution flows into a vehicle's tank. Because the ethanol separates to the bottom of the tank, the octane level of the fuel is reduced and some of the front-end volatility is reduced -- thereby causing problems for the engine.

- The sensitivity of ethanol blends to water is a function of what levels of ethanol and aromatics are contained in the fuel, and the fuel's storage temperature. As little as 50 gallons (190 liters) - which is equivalent to 2 inches (or 5 cm) of water in a 10,000-gallon (37,850 liters) tank - can start phase separation. Low levels of water in the tank bottom will be solubilized into the ethanol blend. Thus, the tank is dried up.

- Good housekeeping to detect and remove the water is probably the most important issue for an owner-operator of a service station.

- Future fuels must have greater amounts of sulfur removed from them to meet stricter vehicle emission standards. Sulfur compounds do have some value due to their energy content, and their provision of volume. But sulfurs are expensive to remove and interfere with the performance of exhaust catalyst emission control systems. (See article in April 2003 TankTalk for more on how cleaner-burning fuels are creating new chemical and operational challenges for tank owners and operators.)