

TANK STORAGE

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FMC Technologies

Ethanol expansion in the pipeline

**Magellan Midstream Partners' CEO
explains how biofuels are being
integrated into infrastructure**

Carbon steel gets the thumbs up

**A comprehensive study has revealed
how to safely contain organic fuels**

BIOFUELS SUPPLEMENT

When adding biofuels to the portfolio, terminals must ensure they are equipped with the necessary blending technology

Taking **special** care

With the US goal calling on biofuels to make up 30% of the petroleum supply by 2030, new production, terminals, and storage facilities are increasing capacity and taking special steps to ensure quality product reaches the market.

Ensuring optimum product quality requires special attention to blending, testing feedstocks, testing processed product and protecting the integrity during loading, shipping and delivery. Without special attention to biofuels, or by treating them like traditional petroleum distillates, product quality can be significantly reduced.

'The type of blending used to mix biofuels is critical to fuel performance,' says Chuck Myers, electronics product manager for the flow control and measurement division of FMC Technologies. 'Because each product has its own unique characteristics, or measurement profiles, parameters such as meter factors, API tables, and density need to be identified in order to deliver an accurate, consistent blend.'

Common types of blending

Splash blending involves loading individual products into a truck through dedicated product meters, one after the other.

Without some type of a mixer splash blending does not work well in a truck because stratification may occur, leading to poor fuel quality.

Sequential blending consists of loading multiple products, one at a time, through one meter and control valve. The method is commonly used for products that have similar density and viscosity, characteristics that enables them to mix well. The disadvantages of sequential

blending biofuels, biodiesel for example, is that when products have dissimilar characteristics the blend may stratify in the fuel due to inadequate mixing or there is not enough room in the truck to get the required volume of each product.

Ratio blending is achieved by loading multiple products into a tank at the same time. Ratio blending employs a meter and control valve for each product and a common header thereby enhancing the mixture, more thoroughly integrating the final product.

Hybrid blending is essentially a combination of both sequential and ratio blending that is designed for ratio blending soybean oil into existing diesel oil sequential blenders.

Sidestream blending, sometime referred to as injection or wild stream blending, meters B100 into the main diesel line, allowing blending to occur directly upstream of the larger delivery meter. Sidestream blending aides in mixing as the blend passes through a meter that mechanically mixes the fuel.

Equipment is critical

Whichever type of blending a marketer or distributor selects requires that each component, biofuel and distillate, flow accurately in a controlled mode throughout the delivery batch. This product flow profile is most critical for ratio or hybrid blenders. If pumps and flow control valves are not sized properly, the process will result in erratic operation and off-spec blends. Myers recommends that a complete pressure profile analysis be done for all operating conditions to ensure accurate blending.

'The key is sizing the metering equipment for the flow rates you are going to be running,' says Myers. 'If you have flow rates that require a



two-inch meter, which will go to 150 gallons and you get to 20 or 30% B100 and higher, then you may need to go to three-inch equipment. You need to size the equipment for your current and your future requirements and that may mean stepping up to multiple blend streams.'

Lake Erie Biofuels, located in Erie, PA, started blending biodiesel roughly seven months ago and has seen a marked increase in interest and demand for its products. 'In the beginning we exported our first one and a half million gallons,' says Mike Noble, director of operations for Lake Erie Biofuels. 'We have had a lot more domestic interest recently.'

Noble uses injection blending with a Smith Meter Accuload III controller for loading and unloading. Its first shipment of 99% biodiesel went to the export market in December 2007 and since that time he has shipped another six million gallons for export. To date the facility has produced and shipped a total of 9.5 million gallons of biodiesel.

The AccuLoad also controls to perform successful unloading of trucks without setting a preset volume. Controlled delivery is

accomplished by the use of three digital inputs, configured as stop, low, and high flow switches. The switches are located on a float installed in an air elimination tank upstream of the meter. The inputs define when to open the control valve, when to advance from low flow to high flow and when to close the valve.

In addition to special attention to blending, Lake Erie conducts a panel of five product tests on all inbound feedstocks including acid value, moisture, soap, plus metals.

Throughout the blending and refining process Noble tests for density, flashpoint, total contamination, oxidative stability, and for acid value, free and total glycerin. Every two hours throughout the process he tests for metals. Once produced the biodiesel runs through cold soak filtration to meet current and future ASTM specifications.

All biodiesel produced and stored by Lake Erie Biofuels is blanketed with nitrogen from the time it leaves the plant to until it is delivered to maintain stability and eliminate moisture. ●

For more information:

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