

# LIGHT & MEDIUM TRUCK

## Adapting to DEF

6-1-2009 By Frederick Kiel

*The diesel exhaust fluid that will be required for some trucks beginning next year should be easy to get, but drivers will require some training and fleets will need to adjust their operations.*

Light- and medium-duty fleets that buy 2010 diesel trucks using selective catalytic reduction will be able to find the diesel exhaust fluid needed to operate these emission-control systems easily and inexpensively, SCR proponents say, but storing and dispensing the liquid will require some adjustments and care by fleets.

DEF, a mixture of 32.5% purified urea and the rest deionized water, will be required by all 2010 and future diesel engines which use SCR to reduce nitrogen oxide emissions. That will include all diesel-powered commercial trucks except for those from Navistar Inc., producer of International Trucks and MaxxForce engines. Navistar will use what it calls an “enhanced” exhaust gas recirculation system, which cuts nitrogen oxide emissions within the engine and does not need an outside catalyst, or agent.

The Environmental Protection Agency was initially cool to the SCR process, partly due to concerns about the availability of DEF, but it does not appear at this time that DEF availability will be an issue, said SCR proponents.

“Light- and medium-duty truck owners are going to have a wide choice of access to DEF and I can’t see anyone having trouble getting it,” Alex LaBrie, principal of Air Blue Fluids, Brea, Calif., a DEF distribution company, told Light & Medium Truck. Air Blue is one of six DEF distribution companies that have committed to distributing DEF nationwide, all ready before 2010.

Engine and truck makers will distribute the liquid in various container sizes through their dealerships. It also will be carried at some truck stops and likely also by convenience stores and local retail outlets, proponents told L&MT.

“We will have DEF available at all volumes from as low as one gallon containers to bulk volumes,” said KC Hall, director of diesel exhaust fluid business development for Cummins Filtration. “Our own brand of Fleetguard DEF will be available by the fourth quarter of this year at more than 20,000 locations in the United States and Canada of the Cummins Filtration network, including 8,000 retail locations.”

DEF has been used in mining and agriculture for years, and several companies have quickly added vehicle-grade DEF production to meet the expected demand.

“We have been producing vehicle-grade DEF for several years, one of two brands that are sold at Mercedes-Benz dealers for their 2009 diesel cars,” Jim Spooner, vice president and general manager of Colonial Chemical Co., Tabernacle, N.J., told L&MT.

Colonial is one of seven DEF producers in the North American SCR Stakeholders Group, an organization that includes truck and engine manufacturers and suppliers of SCR components, DEF and related equipment. Colonial also is one of four DEF suppliers that recently received “certification” from the American Petroleum Institute, which is better known for certifying motor oil grades.

Colonial will ramp up production of vehicle-grade DEF as demand grows, Spooner said, but the company already has the capacity to produce all the expected demand. Colonial will sell to distributors and directly to end-users.

“Light and medium fleets from municipalities, school districts and refuse companies have already called us, and we will sell to them directly,” Spooner said.

### **Storage Issues**

Unlike petrochemical products that can be stored or transported in aluminum, steel or other metal containers, DEF, which is minimally corrosive, can only be stored in stainless steel and several of the most popular plastics.

Companies that build the storage and transport containers, as well as the pump dispensing equipment, said they have designed and tested models for all sizes of containers and are ready to go.

DEF works best in moderate temperatures. Fleets operating in extreme temperature areas or with outside storage systems may have to take steps to monitor the fluid.

“You have to have a temperature-controlled system for outside containers since it freezes at 12 degrees Fahrenheit and can degrade over a long period, six months or more, if stored over 80 degrees.” said Dave Polak, president of Blue1USA, Duluth, Ga. Blue1USA’s sister company, Easy Fuel and Tank Solutions, builds both aboveground and belowground fleet fueling systems.

Colonial’s Spooner said DEF stored indoors will have a minimum of one-year storage life, “though we’ve left it out for two years and used it with no deterioration.”

DEF producers will put manufacturing dates on their 1-gallon, 2.5-gallon and 5-gallon containers. Indoor bulk containers won’t need temperature controls, because indoor temperatures will fall within the safe range.

The SCR 2010 trucks will have onboard containers to hold the DEF. Container size will vary by engine size and manufacturer. Dodge, for example, will use an 8-gallon container on its 2010 diesel-powered 3500/4500/5500 chassis cabs. Freightliner will offer 6-, 8- and 13-gallon containers on its Business Class M2 trucks, depending on the engine and truck size and application. Hino's trucks will have a 4.7-gallon container.

Since DEF turns slushy and will not flow at 12 degrees Fahrenheit and below, truck makers will include a method to warm the solution on the truck, such as a heat exchanger in the DEF tank.

### **Price**

DEF price has been used as a marketing leverage for both proponents and critics of SCR.

Navistar executives have made public statements that DEF could cost up to \$35 a gallon, citing half-gallon container prices they said they found for Mercedes-Benz diesel automobiles.

Though the price for DEF in all its various containers has not been set, Colonial's Spooner said that the company was selling DEF in bulk for about \$2 a gallon.

"If you take the rack price of diesel and see the difference with retail diesel, you'll find that the price will be no problem," he said.

Spooner conceded that the small plastic containers could go for a higher price.

"If you have to buy a gallon of antifreeze if your radiator runs low, that might cost \$6," Spooner said, "but that's not what you pay when you have the radiator flushed and a new supply put in."

### **DEF Usage Calculator**

Cummins Inc. estimates that, on average, a medium-duty truck user (Class 6 or 7) will have to fill the onboard diesel exhaust fluid tank 10 times a year. This assumes the truck has a 10-gallon tank and runs 50,000 miles a year at an average rate of 8 miles-per-gallon with a 2% DEF consumption rate per gallon of fuel.

According to Cummins Inc.:

- Freezing and thawing diesel exhaust fluid does not change its efficiency.
- DEF is nontoxic at all temperatures.

*Jim Galligan contributed to this report.*