



## Handling Diesel Exhaust Fluid

Engine manufacturers are meeting standards calling for reductions in particulate matter (PM) and nitrogen oxides (NO<sub>x</sub>) to near zero levels in a variety of ways. One of the most common is the use of selective catalytic reduction (SCR) technology that utilizes diesel exhaust fluid (DEF). DEF is mixed with the exhaust in the presence of the SCR catalyst, changing the NO<sub>x</sub> into nitrogen and water that are safely released into the atmosphere.

The biggest concern with using DEF is contamination. Impurities in the DEF solution can cause premature failure of the catalyst in the SCR system, often voiding warranties, increasing the amount of DEF used, and sometimes requiring replacement of the SCR system, which can cost \$8,000 to \$15,000. The source of these impurities is typically found in storage and handling practices. Precautions should be taken to reduce the likelihood of introducing impurities since as little as a tenth of a teaspoon of some minerals commonly found in dust, dirt, tap water, etc. are enough to contaminate an entire bulk storage tank of DEF.

Diesel exhaust fluid is a chemical, not a fuel, and needs to be handled differently. DEF should only be stored in stainless steel, coated carbon steel, or in specific high-density plastic containers kept in a temperature-controlled location and out of direct sunlight. Each component of the dispensing system, including tank, piping, pump, filter, and filling stations must be used exclusively for DEF to prevent cross-contamination. Contact with DEF will corrode some metals, such as copper and brass. The use of funnels or bottles that have been used for other fluids or refilling previously used DEF containers will not maintain the pharmaceutical-grade purity needed in the SCR system. When filling equipment, we recommend that you take the time to clean any dust or dirt from around the neck of the DEF tank.

Since DEF is aqueous, it is normal for it to freeze when exposed to temperatures below 12°F. Freezing is not harmful to the solution, and approved containers used for storage are made to withstand the expansion that occurs during freezing.

If you have questions how to keep your DEF pure from delivery through use, contact your local FS Energy Specialist.

