



Handling Diesel Exhaust Fluid

Since January 1, 2010 diesel engine manufacturers have been required to meet EPA 2010 emissions standards which are among the most stringent in the world. These standards called for reducing particulate matter (PM) and nitrogen oxides (NO_x) to near zero levels. Engine manufacturers are meeting these new standards through a variety of ways including the use of Selective Catalytic Reduction (SCR) technology that requires the use of Diesel Exhaust Fluid (DEF). The DEF is mixed with the exhaust in the presence of the SCR catalyst changing the NO_x into nitrogen and water that are released into the atmosphere.

Even if you have not purchased a new piece of equipment recently, you won't be able to ignore DEF much longer. SCR technology has been used worldwide for decades to reduce stationary source emissions due to the economic and environmental benefits. Although other technologies have been evaluated, SCR remains the core NO_x control technology. In addition to on-highway and off-highway heavy equipment utilizing SCR, many new passenger diesel engines are now equipped with SCR as well.

If you are purchasing from a reputable source that meets the ISO 22241 standard, the biggest concern to 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 ultimately needing to be replaced which can cost \$8-15,000. The source of these impurities is typically found in storage and handling practices and precautions should be taken to reduce the likelihood of introducing impurities. As little as a tenth of a teaspoon of some minerals commonly found in dust, dirt, tap water, etc. are enough to contaminate bulk storage DEF.

DEF is a chemical and not a fuel and needs to be handled in a way which is different from the manner that fuel is typically handled. 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, filling stations, must be used exclusively for DEF to prevent cross-contamination because 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 for a period. Freezing is not harmful to the solution and approved containers used for storage are made to withstand the expansion that occurs while freezing.

Please contact your local FS Energy Specialist to make certain you have everything you need to keep your DEF pure all the way from delivery through use.

