



Clean Air and Better Performance. Really!

Both the on-road and off-road diesel engine industry have been in the midst of a significant emission reduction phase driven by the EPA and their enforcement of the 1990 Clean Air Act. This requires a significant reduction of nitrogen oxide (NOx). For on-road applications, requirements have been in place since 2010. The off-road diesel engine market has migrated from the requirements of Tier 3, to Interim Tier 4 and Tier 4 Final in 2014.

The reduction of NOx is accomplished through one of two technologies, Selective Catalytic Reduction (SCR) and advanced Exhaust Gas Recirculation (EGR). These are two very different technologies designed to significantly reduce NOx. SCR is the dominant technology.

For on-road NOx emission reduction, essentially all engine manufacturers have chosen SCR using diesel exhaust fluid (DEF) as the technology of choice to meet their Tier 4 Final requirements that began in 2010. All off-road heavy duty engine manufacturers have either announced SCR as their method to reach their Tier 4 Final NOx reduction or are already offering this technology today.

Selective Catalytic Reduction

SCR use is promoted as one of the most cost-effective and fuel-efficient vehicle emissions control technologies available to reduce diesel engine emissions. Unlike advanced EGR, the use of SCR to control NOx emissions allows diesel engines to be tuned for peak performance. By reducing NOx downstream in the exhaust instead of in the engine, SCR technology reduces fuel consumption and ultimately lowers the cost of operation.

Diesel Exhaust Fluid

Although similar in the front end of the manufacturing process, DEF is not the same liquid nitrogen product frequently used in crop production. DEF is a solution made up of purified water and 32.5 percent automotive-grade urea.

It is used as a carrying agent for the ammonia (nitrogen) needed to reduce NOx emissions in the exhaust. DEF is monitored for quality and has unique quality specifications that must be met to ensure that DEF is an effective, stable, non-toxic, odorless and completely safe solution.

When choosing DEF, make sure it has both the ISO and API certifications. Your FS Energy Specialist is a great resource for additional information and can tailor supply and storage to your individual needs.