

Emissions 103: HOW TO BEST HANDLE DIESEL EMISSION FLUID



In Tier 4 Final machines, Komatsu has added another aftertreatment, Selective Catalytic Reduction, or SCR, to eliminate NOx from emissions by breaking it into unarmful components (namely water and nitrogen gas). To meet previous tier requirements, the injection and valve timings on engines had to be changed, but with Tier 4 Final, those timings have been returned to optimum levels, according to Mike Montgomery, trainer for Columbus Equipment Company.

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Mike Montgomery; Trainer, Columbus Equipment Company

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The SCR process requires Diesel Exhaust Fluid, or DEF, and improper handling of DEF is the biggest issue Montgomery sees with Tier 4 Final engines.

DEF is made of crystalline urea—a form of ammonia—and de-ionized water, and it must be kept clean

and pure. Montgomery said some issues result from the use of bulk tanks of DEF. When DEF is drawn from the tank and put into another container to be carried to a machine, the container has to be perfectly clean or the DEF can become contaminated.

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DEF is also highly corrosive to anything but plastic or stainless steel, so it must be transported in a plastic or stainless steel container. If DEF is accidentally added to any machine system other than the SCR system—if it’s put in the fuel tank, for instance—it will cause major damage to that system.

DEF also needs to be stored correctly or the water can evaporate and cause the urea to turn back to crystals. It must be stored in a cool place out of direct sunlight. DEF will freeze at 12 degrees F so this needs to be considered with its storage.

“By following recommended practices, the risks associated with improper DEF handling can be eliminated. Then, the operational rewards of SCR are significant,” concluded Montgomery.