

DEF Information

DEF (Diesel Exhaust Fluid)

DEF is a urea-based chemical reactant designed specifically for use in SCR systems to reduce NOx emissions

UREA is a compound of nitrogen that turns to ammonia when heated

The raw materials used to produce DEF include natural gas, coal or other petroleum products. DEF is prepared by dissolving solid high purity urea in deionized water to create a 32.5% solution in water. DEF and similar urea-based products are widely used today for a variety of agricultural and industrial needs

Non-toxic and non-polluting
Stable and colorless
Non-hazardous
Non-flammable
Does not require special handling

DEF is required to meet 2010 emissions on all SCR equipped units

DEF Q & A



www.ancochemicals.com

Q. Can an anti-gelling or freeze point improver be added to the DEF to prevent it from freezing?

- A. No. While an additive could improve freeze point of the mixture, the 32.5% solution is very specific to providing NOx reducing properties. Any further blending or adjusting of the DEF mixture will impede its ability to perform correctly and may cause damage to the SCR components. Additives of any type are not approved for use in DEF today

Q. Should I be concerned about handling DEF?

- A. No. DEF is a nontoxic, nonpolluting, non-hazardous and nonflammable solution. It is stable, colorless, and meets accepted international standards for purity and composition. DEF is safe to handle and store and poses no serious risk to humans, animals, equipment or the environment when handled properly

Q. What should I do if I spill DEF?

- A. If DEF is spilled, contain the spilled liquid and absorb it with an inert, non-combustible absorbent material, such as sand. Shovel the material into a suitable container for disposal. Spills into a drain should be avoided. If spilled into a drain, flush thoroughly with water. For significant quantities, contact local authorities for proper disposal procedures. If DEF is spilled on your vehicle, rinse with water

Q. Does DEF smell and is it Corrosive?

- A. DEF may have a slightly pungent odor similar to that of ammonia, however it is completely harmless. DEF is corrosive to copper and brass as well as other materials. Only approved materials, such as high density polyethylene (HDPE), will be used in the DEF tank, packaging and dispensing equipment

Q. Is the DEF dose rate the same for all engine manufacturers?

- A. The DEF dose rate will vary slightly amongst engine manufacturers. While most engines will have a dose rate of 2 to 3% of diesel fuel consumed, the dose rate will range from 1% to 3%

Q. What is Selective Catalytic Reduction (SCR)?

A. SCR is a technology that uses a urea based diesel exhaust fluid (DEF) and a catalytic converter to significantly reduce oxides of nitrogen (NOx) emissions

Q. How does an SCR system work?

A. The purpose of the SCR system is to reduce levels of NOx that are harmful to our health and the environment. SCR is the aftertreatment technology that treats exhaust gas downstream of the engine. Small quantities of diesel exhaust fluid (DEF) are injected into the exhaust upstream of a catalyst, where it vaporizes and decomposes to form ammonia and carbon dioxide. The ammonia (NH₃) is the desired product which in conjunction to the SCR catalyst, converts the NOx to harmless nitrogen (N₂) and water (H₂O)

Q. How will I know that the DEF product I purchase will work?

A. The DEF you purchase should state and display the certification of the American Petroleum Institute (API), German Institute of Standardization DIN70700, the International Organization for Standardization ISO 22241-1, and meet AUS – 32 specifications. This will ensure the proper purity and concentration (32.5%) of urea. For more information on these specifications, visit www.iso.org

Q. How do I keep the DEF from freezing? What happens if the DEF freezes in the tank on the vehicle?

A. During vehicle operation, SCR systems are designed to provide heating for the DEF tank and supply lines. If DEF freezes when the vehicle is shut down, start up and normal operation of the vehicle will not be inhibited. The SCR heating system is designed to quickly return the DEF to liquid form and the operation of the vehicle will not be impacted. The freezing and unthawing of DEF will not cause degradation of the product

Q. Are there special storage requirements for DEF?

- A. DEF should be stored in a cool, dry, well-ventilated area, out of direct sunlight. Freezing will commence at -11 Degree C (12 Degree F), if frozen the product is still useable once defrosted. Prolonged Temperatures above 32 Degree C (90 Degree F) the product will slowly degrade. DEF if frozen will expand approx. 7%, containers are designed to allow for expansion. Shelf life is approximately one year

Q. How much does DEF weigh?

- A. DEF weighs approximately 1.1 kg per Ltr. (9 pounds per gallon)

Q. What happens if I inhale or ingest DEF?

- If you inhale a lot of DEF you should move to an area with fresh air, under normal conditions, the effects are harmless. If you should ingest DEF, do not induce vomiting and a physician should be seen if you experience any symptoms

Q. What happens if a non-DEF substance is entered into the DEF tank?

- A. The SCR system will recognize solutions other than DEF, and a DEF indicator light should appear notifying the driver. Depending on the level of contamination in the tank, the vehicle may require servicing

Q. How much DEF will a truck consume?

- A. DEF consumption is expected to be approximately 2 to 3% of fuel consumption, depending on vehicle operation, duty cycle, geography, load ratings, etc

Q. How can an operator determine how much DEF they will need/use?

- A. DEF consumption will be approximately 2 to 3% of the diesel fuel consumed. Another way to consider it is that DEF will be consumed on a 50 to 1 ratio with diesel. (For every 50 gallons of diesel fuel burned, you will use 1 gallon of DEF). If you know the average fuel consumption of a vehicle, you can easily calculate the amount of DEF that will be used

Annual miles for average truck = 50,000 miles

MPG for average truck = 8 mpg

50,000 miles / 8 mpg = 6,250 gallons diesel fuel per year

DEF usage @ 2 to 3% of fuel consumption = 125 gallons of DEF / year

125 gallons / 10 gallon tank (average size) = 13 DEF fill-ups / year