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Title: Diesel Exhaust Fluid Tips

Applies To: 2013 Model Year Forward International Truck Vehicles Using Selective Catalyst Reduction (SCR) Aftertreatment

Diesel Exhaust Fluid (DEF)

DEF, or Diesel Exhaust Fluid, is the reduction agent used in Selective Catalyst Reduction (SCR) aftertreatment systems. It is a mixture of 32.5% urea and pure (de-ionized) water, and has the following characteristics:

- Nontoxic and Nonpolluting
- Nonflammable
- Stable and Colorless
- Weak Ammonia Smell
- Slightly Alkaline ~ pH 9.0
- Freezes at Approximately -11°C [12°F]
- 9.2 lbs/gallon

Approved DEF is available through Navistar via the Fleetrite® brand (G-19-9251-B) and the Fleetguard Air Shield™ brand (G-19-9280-A). It is also available at many public locations.

NOTE: Although DEF freezes at ~ 12°F, Navistar vehicles using DEF are equipped with component heaters for cold weather operation. No additional operator interaction is required.

Specification:

DEF must meet the International Standard **ISO 22241-1** for diesel engines. There is no acceptable substitute. For engines using SCR and operating in the United States or Canada, it is also strongly recommended that the DEF used be certified by the American Petroleum Institute (API). This would be indicated by a symbol on the container/dispensing system, as shown.



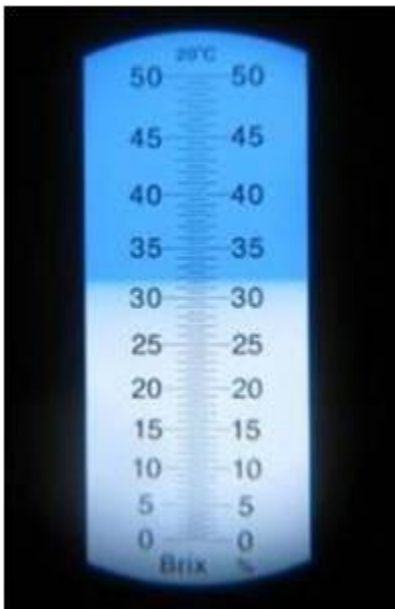
NOTE: Never try to create your own DEF by mixing agricultural grade urea and water. Agricultural grade urea does not meet the minimum quality requirements. It is unlawful to use DEF that does not meet the minimum specifications outlined in standard **ISO 22241**, or to operate an SCR equipped vehicle without Diesel Exhaust Fluid (DEF). Never add water or any other fluids, chemicals, or additives, to the DEF tank. Only approved DEF should be added to the vehicle's DEF tank.

WARNING:

- **In case of eye contact, flush your eyes with large amounts of water for a minimum of 15 minutes.**
- **Do not swallow urea. In the case of ingestion, contact a physician immediately.**
- **Reference the Material Safety Data Sheet (MSDS) from your DEF supplier.**

Testing:

To test the concentration of the diesel exhaust fluid, use a DEF refractometer. When using a DEF refractometer service tool, the acceptable DEF measurement specification is 32.5 +/- 1.5 percent. This specification takes into consideration the refractometer tool tolerances, variability, and calibration when measuring DEF concentration.



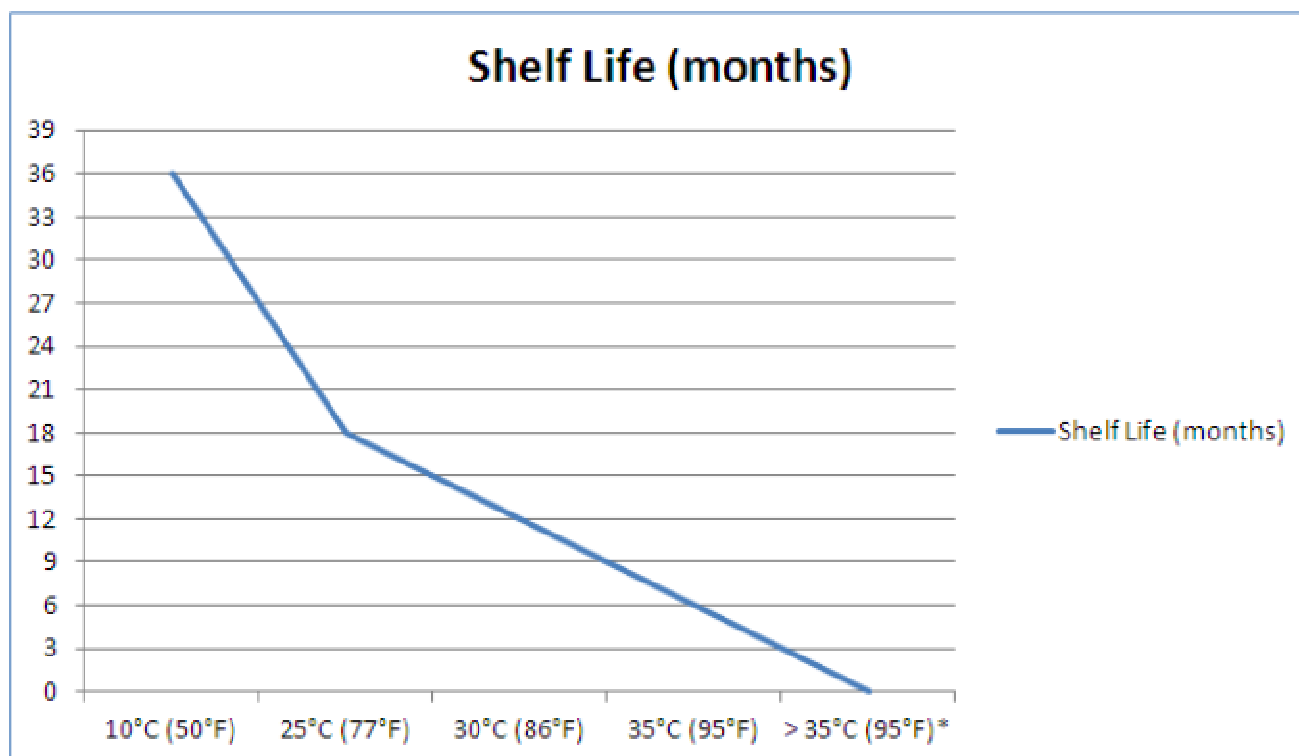
Storage:

The following conditions are ideal for maintaining diesel exhaust fluid quality and shelf life during prolonged transportation and storage:

- Storage temperature between -5°C to 25°C [23°F to 77°F].
- Store in sealed containers to reduce the possibility of contamination.
- Avoid direct sunlight.

In these conditions, diesel exhaust fluid has a minimum expected shelf life of 18 months.

- Each 5°C [9°F] increment above recommended temperatures reduces shelf life by 6 months.
- For example 30°C [86°F] = 12 month shelf life, 35°C [95°F] = 6 month shelf life, etc.



*If stored above 35°C (95°F) significant loss of shelf life has occurred. Check the quality before every use.

Long term storage in a vehicle (in excess of 6 months) is not recommended. If long term storage is necessary, periodic testing of the diesel exhaust fluid is recommended to make sure the concentration does not fall out of specification.

DEF reacts with some materials. Most plastics, highly alloyed steels, stainless steel, and titanium are recommended storage materials. Mild Iron and non-ferrous metals such as zinc, aluminum, magnesium, nickel, and similar materials are not recommended. For detailed information on DEF storage and handling, refer to **ISO 22241-3**.

Cleanliness:

Materials that come into contact with diesel exhaust fluid must be free from any contamination, oil, fuel, dust, detergents, and any other chemicals.

NOTE: Spilled diesel exhaust fluid, if left to dry or wiped away with a cloth only, will leave a white residue. Failure to clean the spilled diesel exhaust fluid from a surface may result in an incorrectly diagnosed leak of the diesel exhaust fluid dosing system.

Before the use of containers, funnels, etc. that will be used to dispense, handle, or store diesel exhaust fluid, make sure to wash them thoroughly to remove any contaminants and then rinse with distilled water.

NOTE: Do not use tap water to rinse components that will be used to deliver diesel exhaust fluid. Tap water will contaminate the diesel exhaust fluid. If distilled water is not available, rinse with tap water and then rinse with diesel exhaust fluid.

Disposal:

If spillage occurs, the diesel exhaust fluid should be either transferred into a suitable container, or covered using an absorbent material and then disposed of according to local environmental regulations. The container **must** be labeled correctly.

- **Do not empty into the drainage system.**
- **Do not empty/release into surface water.**

References:

- ISO 22241-1, 2006: Diesel engines — NOx reduction agent, AUS 32 —Part 1: Quality requirements
- ISO 22241-2, 2006: Diesel engines — NOx reduction agent, AUS 32 —Part 2: Test methods
- ISO 22241-3, 2008: Diesel engines — NOx reduction agent, AUS 32 —Part 3: Handling, transportation and storage

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