

Protecting Diesel Exhaust Fluid From Extreme Cold

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For landscapers and others involved in outdoor work and snow removal, there is always plenty of annual winter preparation. But one thing that may be overlooked is the proper management of Diesel Exhaust Fluid (DEF) used in many [diesel-powered](#) trucks. Handling and storing DEF can be challenging in winter. Made from a mixture of technically pure urea and purified water, DEF freezes at 11 degrees F and needs to be properly maintained and dispensed to preserve its quality.



Like water, DEF will expand up to 7% when frozen and can damage a storage tank if it is full or nearly full when freezing. If you have a tank you think may freeze, it's a good idea to keep it less than full. If DEF freezes in the vehicle, do not put any additives in the tank to help it melt. DEF needs to remain pure for it to work correctly. The vehicle will start without a problem and the DEF tank has a heating element that can quickly thaw the DEF. Don't worry; on-spec DEF is specifically formulated to allow the fluid to thaw at the proper concentration to keep your vehicle operating smoothly.

In addition to freezing temperatures, there are other considerations when purchasing, storing, and handling DEF. Drivers accustomed to purchasing DEF in containers should always look at the expiration date on the bottle—and be sure to use it before this date—since DEF has a limited shelf life. If a date is not present, ask for the most recently delivered product. Also, be sure to

look for the American Petroleum Institute (API) certification mark on the bottle as well. Many diesel engine manufacturers recommend that drivers use



API-licensed DEF.

Storage conditions also have an impact on DEF quality. DEF can be expected to have a minimum shelf life of 12 months or longer in optimum conditions. Check the label for recommended storage temperatures. API recommends against storing DEF in your truck for an extended period of time, especially if the vehicle's storage area is routinely exposed to extreme heat or sunlight.

Purchasing DEF

API has found the biggest misconception by fleet managers is the belief that if the urea concentration of their DEF is on spec, then the DEF meets the required quality. While it's true that the concentration is very important, there are many other important quality characteristics built into the ISO 22241 specification regarding DEF.

Those responsible for procuring DEF should confirm that their suppliers are providing DEF that meets the entire ISO quality standard. To ensure this, ask if the supplier is providing a Certificate of Analysis (or Quality) with every shipment that addresses all of the quality characteristics that the specification requires. You can also check to see if the DEF purchased is licensed through API's real-time directory of licensees on the [API website](#).

Managing DEF

The handling, storage, and dispensing of DEF is very important. Temperature during transport or at the point of storage can harm the shelf life of DEF sold in containers. Make sure the stock is rotated to use the oldest product first. Proper storage temperature is also vital. Storing in temperatures above 86 degrees F will limit the shelf life of the DEF over time. Some additional things to consider in storing and handing DEF include the following:

1. Bulk storage tanks should be dedicated for DEF. Don't switch products in the bulk tank without thoroughly rinsing the tank with distilled or de-

ionized water or on-spec DEF.

2. A closed loop system for transferring DEF from a drum or bulk tank is recommended so contaminants don't get into the DEF. This is particularly important in a site that has dust or dirt in the air.
3. Use dedicated equipment for dispensing DEF. Don't use funnels, pitchers, hoses, etc. that are used for other fluids when putting DEF in a tank.
4. Anything used for dispensing DEF should be cleaned with distilled or de-ionized water and followed by a DEF rinse. Don't use tap water for cleaning.

It's important to know what you're putting into your DEF tank. The quality of the DEF going into your vehicle is as important as the quality of the engine oils or fuels used in your vehicles. Use of API-licensed DEF will ensure it



meets the high standards required.

Harmening has been with the [American Petroleum Institute \(API\)](#) for nearly 10 years and currently manages the Engine Oil Licensing Certification System (EOLCS) program, Diesel Exhaust Fluid (DEF) Certification Program and the Motor Oil Matters (MOM) program. He also oversees the Aftermarket Audit Program (AMAP) which purchases and test thousands of DEF and engine oil samples globally to ensure conformance with required specifications.

Do you have a comment? Share your thoughts in the Comments section below or send an e-mail to the Managing Editor at cmenapace@groupc.com.