

Diesel Exhaust Fluid

Using DEF in Engines with Selective Catalytic Reduction



JOHN DEERE



What is DEF?

DEF, or diesel exhaust fluid, is used in a selective catalytic reduction (SCR) system to remove nitrogen oxides (NOx) from engine exhaust. The main components of the SCR system include the SCR catalyst, the DEF injector, the DEF tank, and the DEF supply module and filter. DEF is injected into the exhaust stream prior to the SCR catalyst. NOx is converted into harmless nitrogen and water through a chemical reaction.

DEF is 32.5 percent high purity urea and 67.5 percent deionized water. This ratio provides the lowest possible freeze point.

DEF is also:

- Colorless
- Nonflammable
- Nontoxic
- Slightly corrosive
- 9.1 lb/gal

Many names and terms are used for DEF

- Urea
- Aqueous urea solution
- AUS32®
- AdBlue®
- NOx reduction agent
- ARLA 32™
- Diesel exhaust fluid

AUS32 is a registered trademark of GBZI LTD.

AdBlue is a registered trademark of VDA, the German Association of the Automotive Industry.



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Where do I purchase DEF?

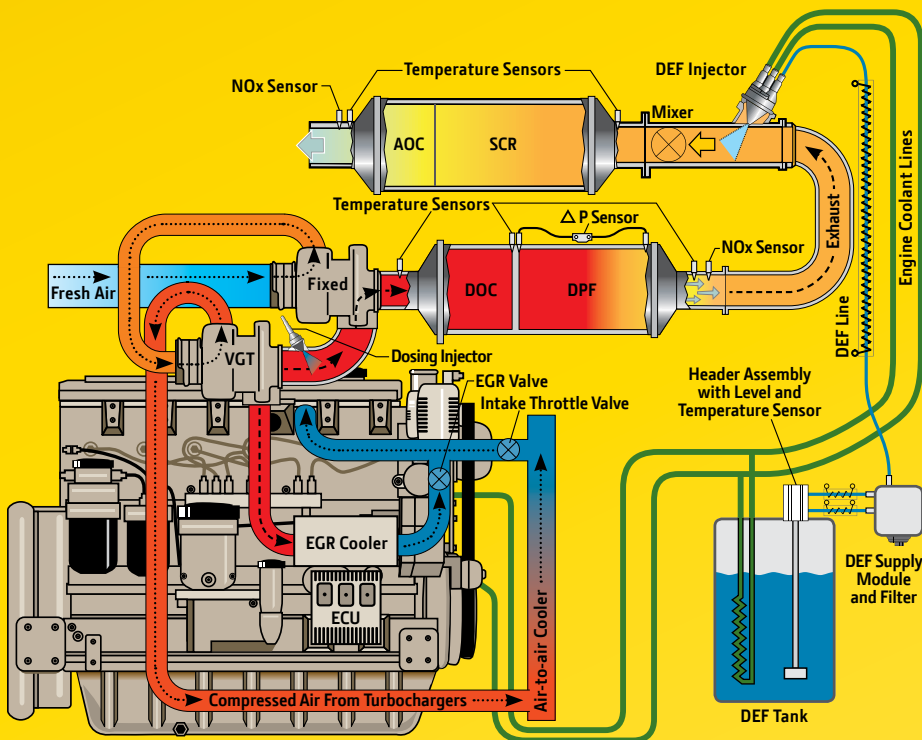
DEF joins the John Deere family of fluid solutions that have provided reliable performance and value for generations. DEF is available in a variety of container sizes, just like the John Deere oils, coolants, lubricants and transmission fluids you use today. Log on to JohnDeere.com/dealer to find the dealer nearest you.

Use only high-quality DEF

The best way to ensure you are getting high-quality DEF for your engine or equipment is to purchase DEF through your John Deere dealer. When you buy DEF from John Deere, you can be confident you are getting a high-quality product that will provide maximum performance while protecting your engine investment. Other DEF may be used only if it meets one or more of the following certifications:

- American Petroleum Institute (API)
- AdBlue®

PowerTech PSS Final Tier 4 technology



What every DEF user needs to know

Diesel exhaust fluid is required in engines with SCR systems. In an effort to ensure every John Deere customer enjoys a positive experience, we want you to know the benefits as well as the cautions of using DEF.

What happens when DEF freezes?

- DEF begins to freeze at 12° F (-11° C)
- Even if DEF freezes solid, it can be used when thawed.
- DEF expands approximately 7 percent by volume when frozen. Allow room for expansion in storage containers and make sure residual DEF is removed from pumps, nozzles, and hoses. Do not use antifreeze fluid products to winterize pumps, nozzles, and hoses as the residual antifreeze fluid can damage the SCR system.
- On the engine or equipment the DEF tank itself is equipped with a heating element that utilizes engine coolant to thaw DEF in temperatures below 12° F (-11° C). The engine can be operated immediately and throughout the DEF tank thawing process.
- Do not add any chemicals or additives to DEF in an effort to prevent freezing. Adding chemicals can damage the aftertreatment system.

How often will users need to fill tanks with DEF?

- DEF consumption is primarily based on engine loads and engine speed.
- Typically, the DEF tank should be checked and filled as part of your normal service checks.
- The DEF filling port is identified by a blue colored cap embossed with the DEF symbol.
- **IMPORTANT:** Never put DEF in a diesel fuel tank.



Is DEF compatible with metals and other materials?

- DEF should always be transported and stored in appropriate containers.
- Only use containers made of DEF compatible stainless steel, high-density polyethylene or polypropylene.
- DEF can be corrosive to certain materials such as steel, iron, zinc, nickel, copper, aluminum, and magnesium.
- DEF contamination, even with trace amounts of metals, can damage the catalyst in the SCR system.

Is DEF harmful to skin?

- DEF is not harmful to handle but requires care.
- Avoid prolonged contact with skin. In case of accidental contact, wash skin immediately with soap and water.

How should DEF be stored?

- DEF should be stored in sealed containers to avoid contamination and evaporation.

Warranty

- The John Deere warranty covers only defects in material and workmanship as manufactured and sold by John Deere. Failures caused by poor quality DEF of any type cannot be compensated under our warranty.
- **IMPORTANT:** Agricultural grade urea or UAN (urea ammonium nitrate) should never be used in place of DEF
- **IMPORTANT:** DEF should never be added to the diesel fuel tank.
- **IMPORTANT:** Diesel fuel should never be added to the DEF tank.

This list of considerations is not intended to be all-inclusive.

Handling and storing diesel exhaust fluid

DEF should be stored in a sealed container, in the shade where possible, and out of extreme temperatures. DEF freezes at 12° F (-11° C), but may be used upon thawing. Exposure to high heat for sustained periods can degrade the quality of DEF. When stored properly, DEF has shelf life that is similar to oils and coolants.

Recommended conditions for maintaining DEF quality

- Store in sealed containers to avoid contamination and evaporation.
- Store in the shade, where possible, to avoid fluid heating from direct sunlight.

DEF should be crystal clear with a light ammonia smell. If DEF appears cloudy, has a colored tint, or has a profound ammonia smell, it should not be used.

Storage information provided is for reference and is to be used as a guideline only. Actual DEF shelf life is determined by many variables. It is recommended to keep DEF in sealed containers and out of high heat for sustained periods. DEF should be purchased in amounts that can be consumed in a reasonable amount of time.

CAUTION: DEF contains urea. Do not get DEF in eyes. In case of contact, immediately flush eyes with large amounts of water for a minimum of 15 minutes. Do not ingest DEF. In the event DEF is ingested, contact a physician immediately. Reference the Materials Safety Data Sheet (MSDS) for additional information.

IMPORTANT: It is unlawful to tamper with or remove any component of the aftertreatment system. It is also unlawful to use DEF that does not meet the required specifications or to operate the engine with no DEF. Never add water or any other fluid in place of, or in addition to DEF. Operating with a modified DEF or use of an unapproved DEF can damage the aftertreatment system.

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