

November 7, 2013

To: All Ford and Lincoln Dealers

Subject: Conditions affecting Diesel Exhaust Fluid (DEF) Shelf Life and Fluid Quality

Diesel Exhaust Fluid (DEF) was launched in Dealer Letter dated 12/17/2009. DEF is required for the 2011 and forward diesel vehicles to meet 2010 EPA emission regulations. DEF is a non-hazardous clear fluid (67% deionized water / 33% chemically pure Urea) that is injected into the diesel exhaust system to reduce NOx emissions.

Since the launch of this new product, we have received several questions on the shelf life and fluid quality for DEF. The following communication provides clarification and guidelines on DEF and the proper storage levels to maintain the chemical concentrations advertised on the label.

#### DEF INVENTORY STORAGE LEVELS

- If a climate controlled facility is available, for maximum shelf life, store between 68°F (20°C) and 23°F (-5°C).
- Store DEF out of direct sunlight. If DEF is stored outside it must be shaded from the sun.
- Store DEF below 86°F (30°C), if possible and/or in the coolest part of the storage facility. If storing DEF below 86°F (30°C) is not feasible, the inventory needs to be managed accordingly.
- For periods when DEF will be exposed to average daily temperatures that will exceed 95°F (35°C), inventory should be kept to a minimum. Do not purchase more product than will remain in inventory beyond the shelf life shown in the chart if average daily temperatures will continually exceed those shown in the chart below.
- DEF will freeze below 12°F (-11°C). Do not store outside or in a facility where the temperature will drop below 23°F (-5°C).
- Shelf life should be based on the period of time past the date code on the bottle. The date code is formatted as MMDDYY (i.e. 022810 = February 28, 2010).
- The issue with selling DEF that is beyond its shelf life is the possibility of selling the customer a product that does not meet what is advertised on the label.

The table below shows shelf life for DEF continuously exposed to these temperatures for the entire period. Cycles where the maximum daily temperature is similar to what is shown below will have longer shelf life than shown. Shelf life for product in inventory should be based on the average daily temperature not the day's maximum temperature.

**DEF Shelf Life versus Temperature**

Constant Ambient Storage Temperature	Shelf Life In Months
≤50 °F (10°C)	36
<77 °F (25°C)	18
≤86 °F (30°C)	12
≤95 °F (35°C)	6
≤104°F (40°C)	2

**EXAMPLE:** In 2009 the two hottest months in Phoenix Arizona were July and August. The average temperature for both months was 95°F (35°C), according to the data from the National Weather Service. The average daily temperatures for these months ranged from 104°F (40°C) to 85°F (29°C), while for

some days daily highs reached 115°F (46°C). For areas that see these average temperatures DEF shelf life would be 6 months.

### **DISPENSING NOZZLE**

- Available for Motorcraft DEF is a nozzle that will allow the operator to add DEF to the tank while minimizing contamination, spilling and over filling.
- Nozzles can be reused but should be properly stored between fillings. Nozzles come in a resealable plastic bag and should be rinsed with clean water before being stored in it's re-sealable plastic bag.
- The DEF nozzle should not be used for other chemicals, like oil, coolant, etc.

### **VEHICLES CONTAINING DEF**

DEF in a vehicle is still acceptable for vehicle consumption even if the vehicle has been exposed to temperatures above 86 °F (30°C). For the same reasons stated above, at these temperatures, urea concentration will remain reasonably stable.

- DEF in vehicles is susceptible to the same degradation as in containers.
- The SCR (selective catalytic reduction) system has been calibrated to function properly with urea concentrations different than 32%. The only consequence of operating with a urea concentration less than 32% is faster consumption.
- DEF that has degraded beyond the point for the calibration to compensate will set off a warning on the instrument panel (refer to the diesel supplement in the owner guide).
- Unless there is a warning light on the instrument panel there is no reason to consider draining the DEF from the tank simply due to age of the DEF. However, it is highly unlikely the warning would be caused by aged DEF and normal diagnostics should be followed.
- DEF freezing in the vehicle tank will not cause any problems ***as long as the tank is not over filled***. The vehicle is equipped with a heater to thaw frozen DEF when the vehicle is started and then the system will function normally.

### **LARGE CONTAINERS OF DEF**

Large containers, 55 gallon drums and 275 gallon totes are affected by temperature the same as described above for containers. Shelf life should be estimated using the temperature chart. Due to the mass of fluid, the temperature fluctuations may not be as great as smaller containers.

- Refilling of Motorcraft drums and totes is not an acceptable practice and bulk DEF is not available from Motorcraft
- Fluid in drums and totes are more susceptible to contamination since at times the container will be open to the atmosphere and dispensing equipment will be removed and installed
- Minimize the time the bung hole is left open
- Be sure the dispensing equipment is clean before inserting it into the drum or tote

### **DEF DISPENSING EQUIPMENT FOR LARGE CONTAINERS**

Use the proper dispensing equipment that is specifically made for DEF.

- Dispensing equipment must be made of stainless steel or plastic compatible with urea (ie, polyethylene, polypropylene, etc. See ISO22241-3).
- DEF is corrosive to most metals.
- The use of dispensing equipment made of materials incompatible with DEF, like used for coolant or oil dispensing equipment, will corrode and contaminate the DEF and the equipment will eventually malfunction.
- DEF Dispensing equipment is available through Rotunda (order on the web through PTS by clicking on Rotunda or by calling 1-800-ROTUNDA and select option #2).

### **QUESTIONS**

For questions, please contact your Aftermarket Zone Manager or Robert Boss ([rboss@ford.com](mailto:rboss@ford.com)).