Better Every Call.

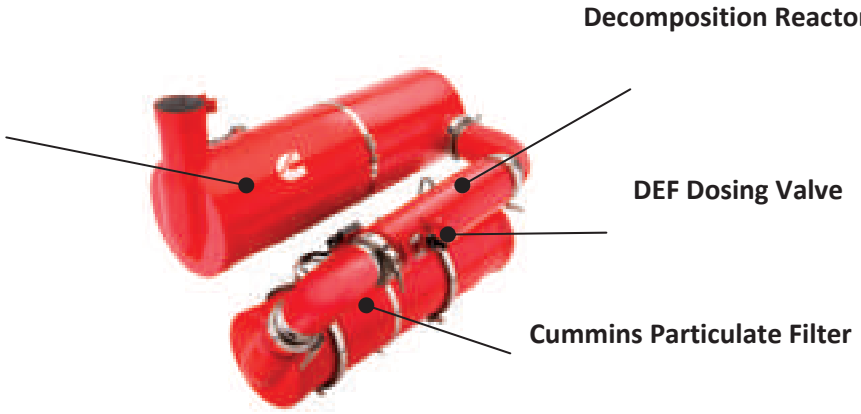
Cummins 2010 Solution for Fire Truck Applications

Why Selective Catalytic Reduction (SCR) is the Right Technology for 2010

- **Increased Horsepower and Torque without increasing displacement**
- **Improved Operator Satisfaction**
  - Improved throttle response and driveability
  - Easy operation for driver
- **Improved Reliability and Durability with SCR Technology**
  - In-cylinder technology necessitates massive Exhaust Gas Recirculation (EGR) flow which may produce excessive acidic condensation resulting in power-cylinder corrosion and rapid deterioration of lube oil
  - In-cylinder technology significantly increases EGR rates up to 50% (more than double) over an SCR solution
- **Fully Integrated Subsystems efficiently reduce emissions and lessen the need for frequent Diesel Particulate Filter (DPF) regenerations.**
  - Fewer DPF Regenerations than current engines with SCR technology
- **Minimal Change in Heat Rejection vs. today's product**
  - With SCR, no need to adapt cooling packages to accommodate higher heat rejection
  - With SCR, no major redesign, if any, of radiator, charge air cooler, and/or fan systems
  - In-cylinder technology increases EGR rates up to 50% over an SCR solution, leading to increased heat rejection
- **Fuel Economy** is 5 -9 % better with SCR technology than with in-cylinder technology for both Heavy-duty and MidRange engines.
  - With SCR technology, combustion efficiency is significantly improved as compared to an in-cylinder technology and leads to:
    - Fewer engine pumping losses
    - Lower intake and exhaust manifold pressures
    - Decrease in DPF regenerations
- **SCR is a proven technology**
  - Cummins has extensive experience with this technology and has been using it in Europe since 2006
  - Cummins Emissions Solutions has built and shipped over 250,000 SCR systems
  - Cummins has built and shipped over 50,000 engines with SCR systems

Cummins Aftertreatment System

- **Proven Cummins Particulate Filter reduced particulate matter by over 90%. New for 2010 is the SCR Catalyst for NOx reduction.**



How SCR works

- Exhaust gas containing Oxides of Nitrogen (NOx) exits the Cummins Particulate Filter and enters a tube called the Decomposition Reactor, where a fine mist of Diesel Exhaust Fluid (DEF) from the holding tank is sprayed into the hot exhaust stream.
- DEF breaks down into ammonia (NH3) during a chemical reaction in the Decomposition Reactor through a process known as hydrolysis.
- The NOx and ammonia (NH3) pass into the SCR element where a catalytic reaction takes place, converting the NOx into harmless nitrogen gas (N2) and water vapor (H2O).
- The result - near zero emissions.

To watch a video on How SCR Works, go to www.everytime.cummins.com

How much DEF will be needed?

- DEF consumption will be approximately 2% of your fuel consumption.
- DEF tank size will be determined by the vehicle manufacturer. Cummins recommends a DEF tank size at 6% the size of the vehicle fuel tank. (If the vehicle has a 50 gallon fuel tank, the DEF tank would need to be a minimum of 3 gallons.)

Here's an example:

- Annual miles for average truck (urban setting) = 7,000 miles
- Assume average MPG = 5 mpg
- 7,000 miles / 5 mpg = 1,400 gallons diesel fuel per year
- DEF usage @ 2% of fuel consumption = 28 gallons of DEF / year
- **28 gallons / 5 gallon tank = only 6 DEF fill-ups / year**

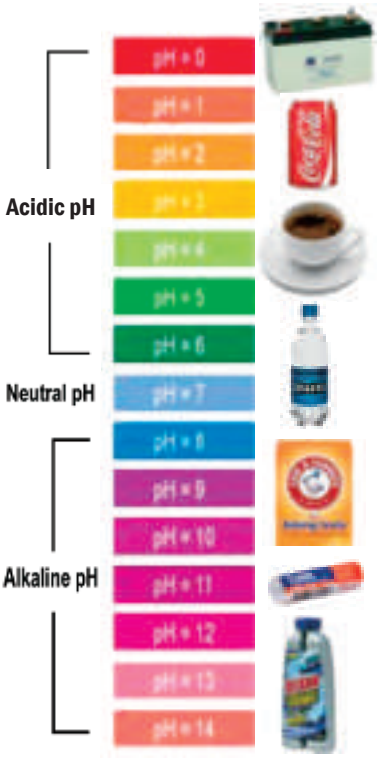
**Based on 5 gallon DEF tank sizing and a 50 gallon fuel tank

To calculate specific fleet usage, go to www.cumminsfiltration.com.

Where can DEF be found?

- All Cummins Distributor locations will have DEF available for sale in October 2009.
- DEF will be readily available for customers to purchase in thousands of locations in US and Canada. Cummins Filtration will offer DEF in a variety of sizes of packaging from bulk to 1, 2.5 and 5 gallon jugs.
- Customers can be confident in the availability of DEF. To talk to a Cummins representative about questions on DEF or for the nearest retail outlet, customers can call:
  - Cummins Filtration at 1-800-22FILTER
  - Cummins Customer Assistance Center at 1-800-DIESELS

The Facts about DEF



- **FACT:** DEF is a solution of 32.5% automotive grade urea and 67.5% deionized water.

- **FACT:** DEF is SAFE to handle and store. It is NON-toxic, NON-polluting, and NON-flammable.

- **FACT:** DEF will freeze at 12 F (-11C). Frozen DEF does not impact the start up of or the operation of the vehicle.

- **FACT:** DEF and urea do not become toxic – even if stored at extreme temperatures.

- **FACT:** DEF is slightly alkaline with a pH of approximately 9. That's about the same as household baking soda.

- **FACT:** DEF pricing will be at or below the price of diesel fuel in 2010 as the population of SCR equipped engines enters the marketplace.

Driver Training and Tips

- Drivers can expect better driveability and better performance with Cummins 2010 engines
- Drivers can expect to see a new DEF Lamp. This lamp will illuminate when the DEF level is low.

Diesel Exhaust Fluid (DEF) Lamp

How the Competition Stacks Up

Engine Model	Displacement	Horsepower	Peak Torque
ISB6.7	6.7 liters	260 - 360 Hp	660 - 800 lb-ft
ISC8.3	8.3 liters	270 - 380 Hp	800 - 1050 lb-ft
ISL9	8.9 liters	345 - 450 Hp	1150 - 1300 lb-ft
MaxxForce 10	9.3 liters	310 - 350 Hp	1050 - 1150 lb-ft
ISX11.9	11.9 liters	370 - 500 Hp	1450 - 1645 lb-ft
MaxxForce 13	12.4 liters	410 - 475 Hp	1450 - 1700 lb-ft
DD13	12.8 liters	350 - 500 Hp	1350 - 1650 lb-ft
ISX15	15 liters	455 - 600 Hp	1750 - 1850 lb-ft

Better Every Call.

- **Cummins is the only engine manufacturer to design and manufacture all critical subsystems, from air intake to exhaust aftertreatment, in-house.**
- **Cummins will maintain consistency in proven SCR technology to meet the ever-changing emissions standards.**
- **Maintenance Intervals for 2010 engines are the same as today's engines. There will be one new maintenance item, a DEF Filter, which will need to be changed every 200,000 miles.**
- **Cummins support network is the best in the industry with over 3,500 authorized Cummins dealers and distributors throughout North America.**
- **For further details on why SCR is the Right Technology for meeting EPA 2010 emissions, visit us at www.everytime.cummins.com.**

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