

# KNOWLEDGE IS POWER



{The truth about e3<sup>™</sup>} clean air technology.

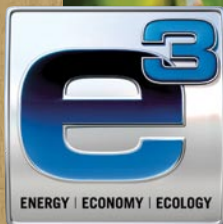








# COMPLIANCE WITHOUT COMPROMISE



## Work hard. Breathe easy.

Finally, there's emission technology that complies with you. Because AGCO, Challenger and Massey Ferguson row crop tractors now offer you the most farmer-friendly approach towards meeting upcoming EPA standards—without making trade-offs in power, productivity and operating costs.

## With e3 you don't give up a thing.

- Uncompromised horsepower and torque
- Significantly improved fuel economy
- An easier, more efficient path to meeting EPA standards now and in the future
- e3 engines run cooler
- And e3 technology adds nothing to the price of the tractor

**"EVERYONE WANTS A CLEANER WORLD, BUT NOBODY  
WANTS TO PAY MORE FOR FOOD. THE FARMER'S  
STUCK IN THE MIDDLE."**

*~Farmer / Kansas  
2,700 acres in wheat and hay*

## The hottest, coolest thing in clean air technology.

Let's get one thing straight right from the start. When most farmers think of meeting emission standards, they think of the trouble long-haul truckers have experienced with the EGR (Exhaust Gas Recirculation) process of emission control. Loss of power, increased costs, reduced fuel efficiency and most troubling of all—excessive heat rejection.

The plain fact is, that e3 is an SCR process (Selective Catalytic Reduction), not the EGR process that truckers have had to deal with. It's entirely different technology that works for you, not against you. Read on and you'll find that the truth—and the proven technology—speaks for itself.

## We're on your side.

It's as simple as that. Which is why we created e3 technology in the first place. It's designed to provide you with all the energy you need—in the form of undiminished horsepower and torque. And it promises better fuel economy than our competitors—up to 15% better. In short, e3 efficiently delivers exactly what the situation demands—cleaner emissions, improved economics and reliable performance.







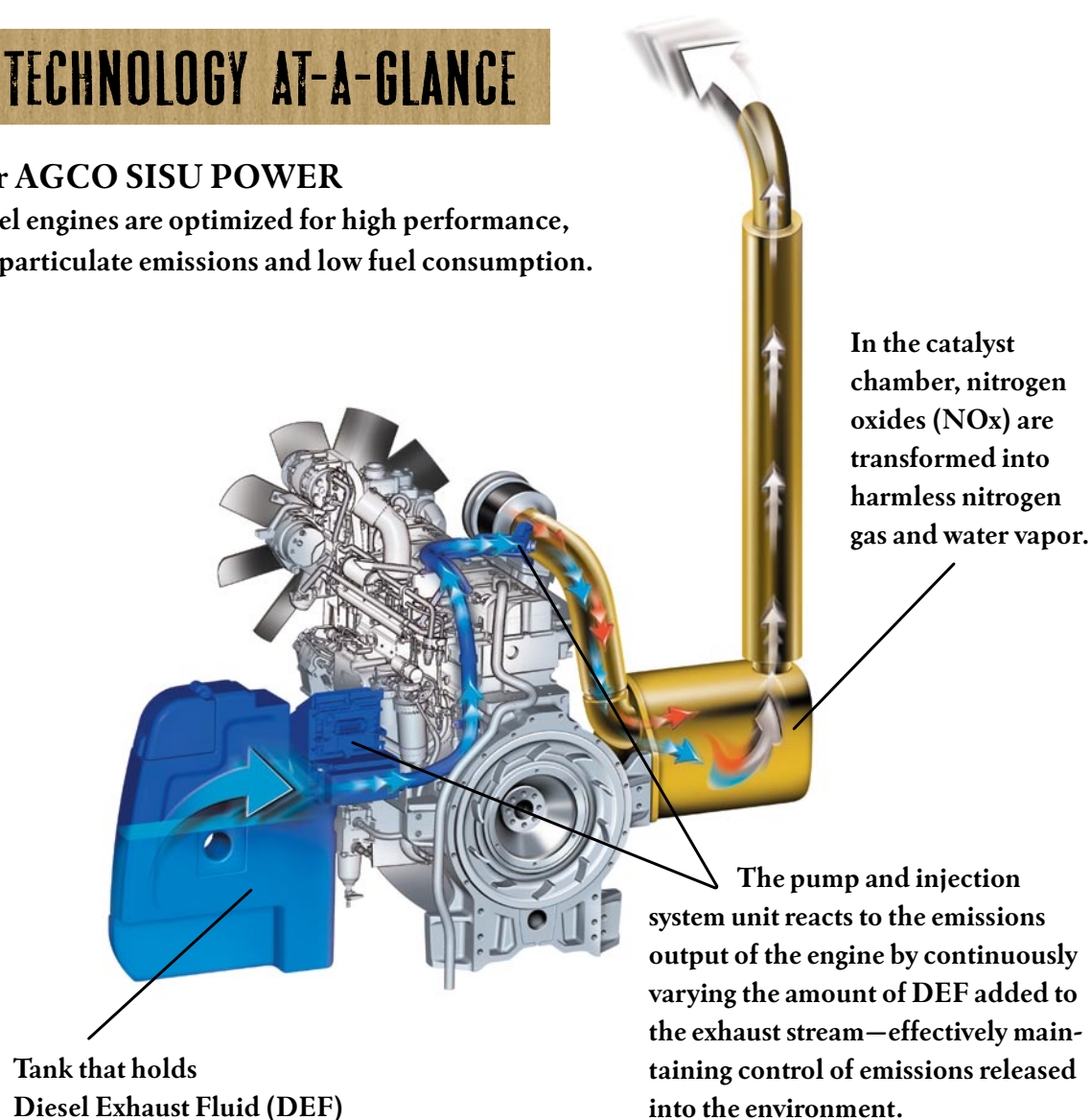
**"I NEED TECHNOLOGY THAT  
MEETS EPA STANDARDS.  
BUT FIRST IT HAS TO  
MEET MINE."**

*~Farmer / Nebraska  
3,000 acres in corn  
and soybeans*

## E3 TECHNOLOGY AT-A-GLANCE

### Our AGCO SISU POWER

diesel engines are optimized for high performance,  
low particulate emissions and low fuel consumption.



As simple as it is effective, our e3 version of SCR technology treats the downstream exhaust with Diesel Exhaust Fluid (DEF), which breaks down harmlessly into nitrogen and water vapor. Believe it or not, the e3 process, along with electronic engine management, actually allows our AGCO SISU POWER™ diesel engines to run better, stay cooler and last longer.

e3 is a post combustion, after-treatment process that takes place in the exhaust system, never interfering with the performance of the engine itself. The technology is simple, robust and reliable, consisting of very few parts. Main components include a tank, an injection system and an SCR catalyst chamber.



**"SEEMS LIKE OTHER FOLKS JUST HUG TREES.  
FARMERS EMBRACE THE LAND."**



**"FUNNY, IT DOESN'T SEEM LIKE YOU'RE SAVING THE PLANET."**

*~Farmer / Minnesota 2,000 acres in corn and soybeans*

### **Welcome to 2014.**

EPA regulations are only getting tougher. Tier 4 interim standards must be met by 2011. And Tier 4 final standards by 2014. We're so sure that e3 SCR technology is the best way—the only way—to achieve those standards without sacrificing performance and fuel economy, that we can say it's virtually inevitable our competitors will end up taking the same path.



### **The best way to get there from here.**

e3 is a simple, robust solution that doesn't increase heat rejection like EGR technology does. EGR recirculates exhaust gases and burns them again, so it often involves extensive exhaust cooling systems, valves and ultra high pressure injection. It also increases ash and soot in the oil.

Our e3 SCR process is free of all of that.

### **Cleaner air. Pure performance.**

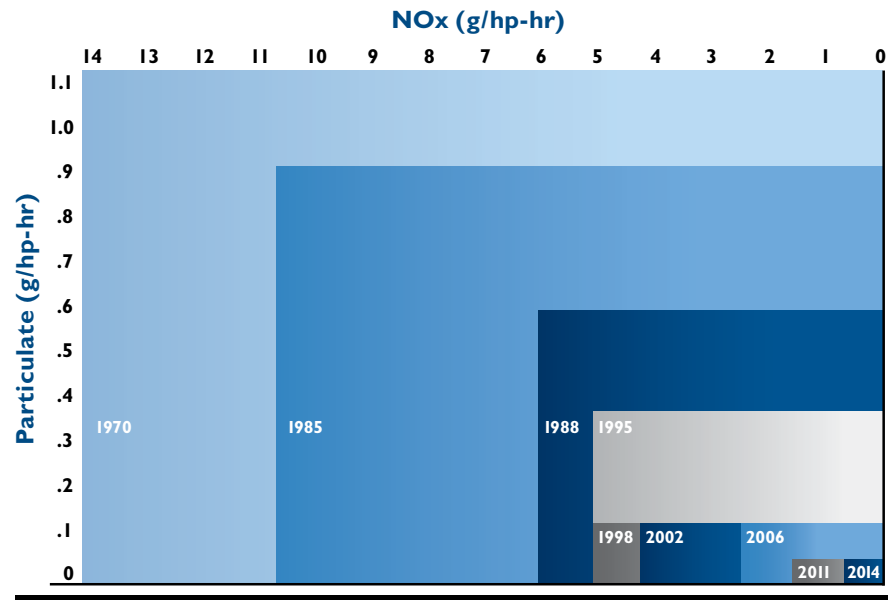
Just think. By the time we get to 2014, the air coming out of our engines with e3 technology will actually be cleaner than the air going in. It's compliance you can live with in more ways than one, because it not only helps protect the environment, it helps you continue doing your part to feed the world. Pure productivity. That's what e3 is really all about.

### **Enhanced fuel economy.**

Since the e3 process is an after-treatment, it's completely separate from the main engine functions. So it allows our AGCO SISU POWER diesels to stay focused on producing efficient power and torque, without having to deal with reducing emissions—thus increasing fuel economy. Aren't your other input costs for fertilizer, feed and seed high enough? Why not save money while you're saving the planet?



# THE HISTORY—AND FUTURE—OF EPA STANDARDS



## What lies ahead?

This chart shows how the EPA standards have grown progressively more stringent since the early days of emission regulation. Tier 4 interim requirements go into effect in 2011 and Tier 4 final standards must be met by 2014. At each step, reduced NOx and PM emissions are represented by a smaller rectangle.



## Let's be eco-rational.

And let's be honest. Farmers were green before green was cool. You literally *have* to take care of the land. Your livelihood depends on it. Not to mention the livelihood of your future generations. With e3, we've shown we respect that fact. And we'll never forget the EPA doesn't run your farm. You do.



## Great minds think alike.

Many of the finest engineering minds in the world agree that SCR technology is the way to go. Which is why it's been adopted by Mercedes-Benz®, Volvo® and BMW®. One major American engine manufacturer has tested SCR technology over 7 million miles in extremes—from below-zero climates to the deserts of Arizona, Nevada and California. And today there are 500,000 heavy-duty SCR clean diesel trucks throughout Europe and even in the Arctic Circle.

## Still have questions? Just turn the page.

While e3 is basically an uncomplicated technology, the more you know about it, the better. Let's move on to answering some commonly asked questions—and to debunking some myths.

Also, remember you can always consult with your dealer.

Or visit [www.AGCOcorp.com/e3](http://www.AGCOcorp.com/e3).



# WHAT'S THE BEST PATH TO TIER 4? JUDGE FOR YOURSELF.

## EGR (EXHAUST GAS RECIRCULATION)

In the EGR system, exhaust gases are cooled, blended with fresh air, then returned to the cylinder, lowering combustion temperatures and resulting in reduced nitrogen oxides (NOx). This approach can include extensive exhaust gas cooling systems, recirculation valves or ultra-high pressure injection. It also increases ash and soot in the oil.

- Reduced fuel efficiency
- Added cost
- Complex system
- Louder
- Hotter running—requires additional or enhanced cooling packages

## SCR (SELECTIVE CATALYTIC REDUCTION)

With SCR nitrogen oxides (NOx) are dealt with post combustion. A solution of Diesel Exhaust Fluid (DEF), consisting of urea and water—is sprayed into the hot exhaust gases. This mixture then passes through a catalyst chamber where the nitrogen oxides (NOx) are transformed into harmless nitrogen gas and water vapor.

- Enhanced fuel efficiency
- No cost increase
- Simple system
- Quieter
- Cooler running

## E3 AND SCR TECHNOLOGY

The whole truth and nothing but the truth.



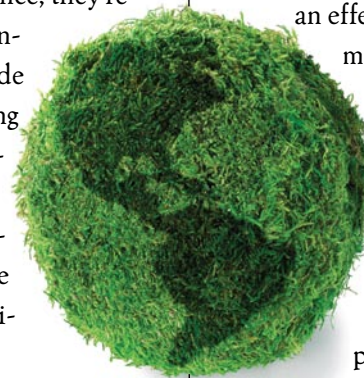
With any new technology there are always plenty of questions. No different here. How does SCR technology really compare to EGR? Which is truly the best way to go? What about servicing? The supply of DEF? We're more than happy to provide some answers. Let's get started.

## REAL QUESTIONS FROM REAL FARMERS.

### THE TRUTH ABOUT e3.

**Q: Just hearing the words emission control makes me mad. What's the real story on these EPA requirements?**

**A:** As we all know, clean air is essential for quality of life. And while farm vehicle emissions are small compared to trucks, for instance, they're not insignificant. As an industry we've already made good strides, just reaching Tier 3, but Nitrogen Oxide (NOx) and Particulate Matter (PM) continue to cause problems like smog, acid rain and respiratory problems.



**Q: How can e3 reduce emissions, save fuel AND optimize power and performance? I don't get it.**

**A:** The key to its success is the fact that it's a post combustion process. It stays out of the way of what the engine is built to do—provide power. After the engine does that and the exhaust leaves the engine, all that remains to be done is to reduce the nitrogen oxides (NOx). Our e3 SCR is an effective, thoroughly tested method of doing just that.

**Q: What is the added cost to the tractor for e3 technology?**

**A:** There is nothing added to the purchase price of a tractor equipped with e3 technology.



**Q: How much money can e3 save me in fuel consumption?**

A: Compared to competitive models, e3 technology delivers up to 15%\* in fuel savings. For example, if you normally consume 10 gallons per



hour, use your tractor for 600 hours per year and assume \$2.70 diesel fuel, you would save an estimated \$2,430 per year. To calculate

your potential savings just visit [www.agcocorp.com/e3](http://www.agcocorp.com/e3).

**Q: What about servicing. Isn't it more complicated?**

A: No, the e3 SCR process is a simple one. Dealers require no special training, diagnostic equipment or tools to service the system. The lifespan of SCR components is equal to the engine's lifetime and servicing basically comes down to periodic filter replacements.



**Q: What about the heat issue? I've heard these exhaust systems can cause fires.**

A: No problem there. The system that increases heat rejection in diesel engines is an entirely different technology called EGR.

**Q: Who else is using SCR technology in agriculture?**

A: AGCO is first to offer SCR technology in agriculture although we're certain our competitors will follow, initially in Europe then in North America. SCR has already been adopted by Mercedes-Benz, Volvo, Cummins®, Detroit Diesel® and PACCAR®.

**THE TRUTH ABOUT DEF.**

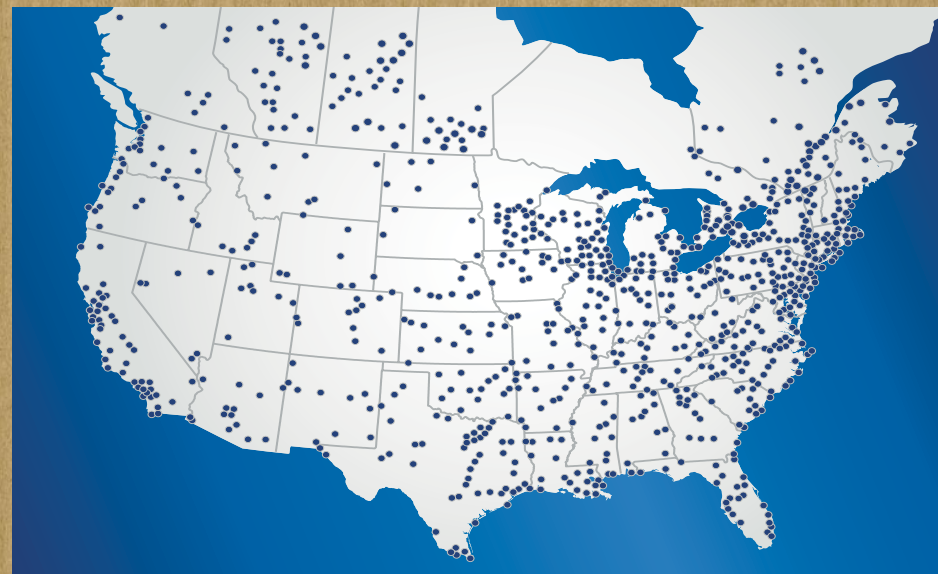
**Q: What does Diesel Exhaust Fluid (DEF) cost?**

A: DEF is expected to cost about the same as diesel fuel. Cost for DEF will more than be recovered by the savings in fuel efficiency.

**Q: How long can I go between Diesel Exhaust Fluid (DEF) refills?**

A: DEF will be stored in a 8 gallon (30L) tank separate and adjacent to the diesel fuel tank on the tractor. For every 100 gal. of diesel fuel burned, you'll only use three gallons of DEF. At current Tier 3 levels, consumption of DEF is about

# DEF AVAILABILITY IS WIDESPREAD



2.5 to 3% of fuel consumption, depending on load.

**Q: Will DEF be available in my area?**

A: Absolutely. There are literally thousands of supply locations springing up across North America. Since the trucking industry has already adopted SCR technology as the inevitable path to Tier 4, availability at truck stop chains is spreading nationwide. You'll find DEF marketed under various brand names including AdBlue® and TerraCair®. AGCO will also distribute DEF via its network of equipment dealers across North America.

**Q: What would happen if I run my DEF tank dry while operating my tractor?**

A: Operators will be provided with ample warning of low DEF levels. If this warning is ignored, an electronic switch will automatically cut engine power to half its output (safe mode). Running the tractor without DEF will not cause damage and all normal functions will be automatically reset once the system senses the DEF level has been restored.

**Q: Can I store the Diesel Exhaust Fluid on my farm?**

A: Yes. DEF will commonly be distributed in 2.5 gallon (9.4L) jugs, 55 gal. (208L) drums and 275 gal.



\* Based on OECD tests of fuel consumption at Max. PTO Power (g/kWhr).





(1041L) intermediate bulk containers (IBC's). DEF is environmentally harmless, so no special precautions are necessary except to avoid freezing in temperatures below 12°F (-11°C). To that end, a heater band is available for 55-gallon and 275-gallon DEF containers, to prevent freezing. DEF should not be stored for more than a year, because after that time the solution can break down.

**Q: Is Diesel Exhaust Fluid (DEF) a fuel additive?**

A: No, DEF isn't added to diesel fuel nor burned by the engine. It is used only by the exhaust system to treat exhaust gases. DEF is stored in its own tank on the tractor and replenished in a similar way to refueling.

**Q: Is DEF corrosive? Is certification needed to store DEF?**

A: DEF is non-toxic and poses no serious risk to humans, animals or the environment. The product is slightly alkaline with a pH of 9.0 so should not be kept in contact with aluminum, brass or mild steel. Prolonged

skin contact may cause irritation. DEF should be rinsed with water if spilled on painted surfaces. No certification is required to handle or store DEF.

**Q: I've heard there could be problems with the Diesel Exhaust Fluid freezing in cold weather.**

A: The fact is, DEF begins to gel at about the same temperature as diesel fuel: 12°F (-11°C). A pump empties the system when the engine is shut down. And even if frozen, DEF thaws quickly from the warmth supplied by the heated tank and delivery line system.

**Q: Is DEF required to meet any quality standards?**

A: Yes, stringent (ISO 22241 and DIN 70070) standards for purity and concentration have been established.

**Q: Can e3 technology be installed as an aftermarket item?**

A: No, e3 is only available on new machines and cannot be retrofitted.

**AGCO SISU POWER diesels  
set a new standard all their own.**

- The e3 SCR system, combined with the SisuTronic™ electronic engine management system significantly improves fuel economy.
- Better fuel economy means lower CO<sup>2</sup> emissions.
- Improved combustion results in emission levels of Particulate Matter that are 70% lower than Tier 3 requirements.
- Optimized combustion decreases heat rejection by 15%, so the cooling package can be smaller and more efficient.
- AGCO SISU POWER engines are B100 biodiesel ready.

AGCO, Your Agriculture Company, is a premier manufacturer of agricultural equipment, providing high-tech solutions for professional farmers feeding the world.

The company is dedicated to delivering superior customer service, innovation and quality. AGCO products are distributed in more than 140 countries worldwide.

***For more information about e3:***

***Call 877-525-4384 or visit [www.agcorp.com/e3](http://www.agcorp.com/e3)***

***Or visit your local AGCO, Massey Ferguson or Challenger Dealer.***

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