

# AST and UST Storage of DEF – What's Best for You?



# Outline



- **What is SCR & DEF?**
- **DEF Industry Background**
- **DEF Market Update**
- **Storage and Dispensing Equipment Solutions**

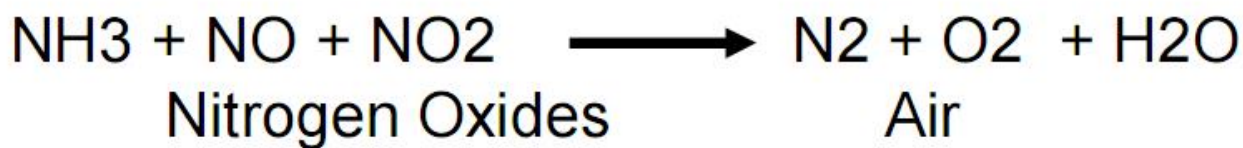
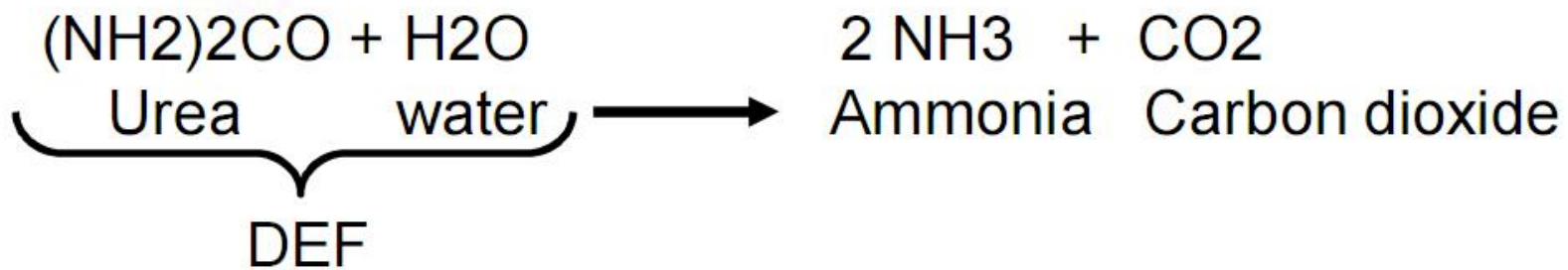
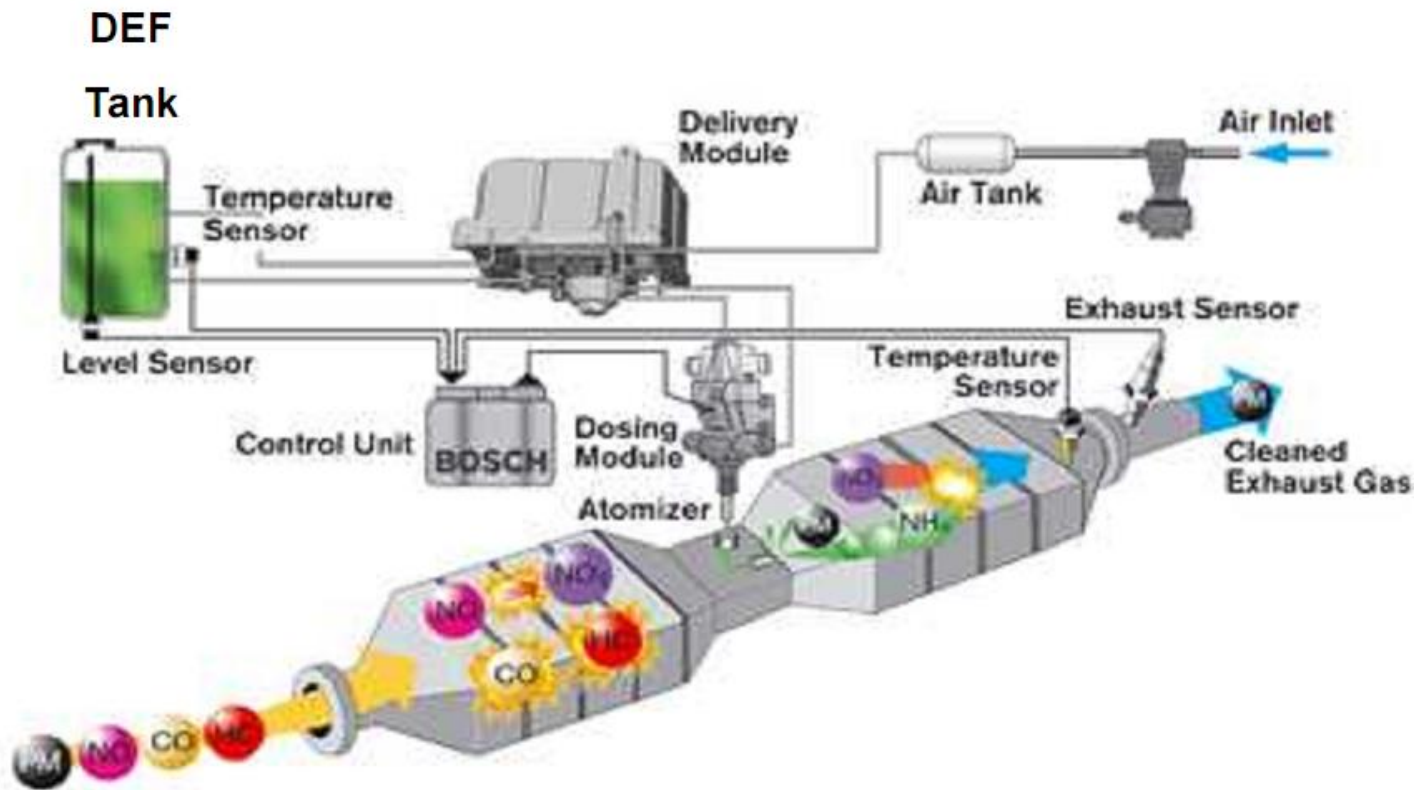


# Why DEF?...2010 EPA Mandate

- Clean Air Act of 1970
- Reduces Harmful NOx (Nitrogen Oxides)
- Technology of Choice – Selective Catalytic Reduction (SCR)
- Stages of Mandate:
  - 2010 All on-road diesel vehicles (Class 1 – 8)
  - 2012 Off-road (Construction, Agriculture & Generators)
  - 2014 Marine (freshwater)
  - 2015 RR locomotives
  - 2017 Marine (Ocean vessels w/ US flags)



# Selective Catalytic Reduction (SCR)



# DEF Material Compatibility

## COMPATIBLE

Plastics  
(HDPE, CPVC)  
Rubber  
Stainless Steel  
(304 & 316)  
*Fiberglass*  
Fiberglass

## NOT COMPATIBLE

Carbon steel  
Iron  
Zinc  
Nickel  
Aluminum  
Copper  
Brass



# ISO Certification

ISO Standard 22241 -

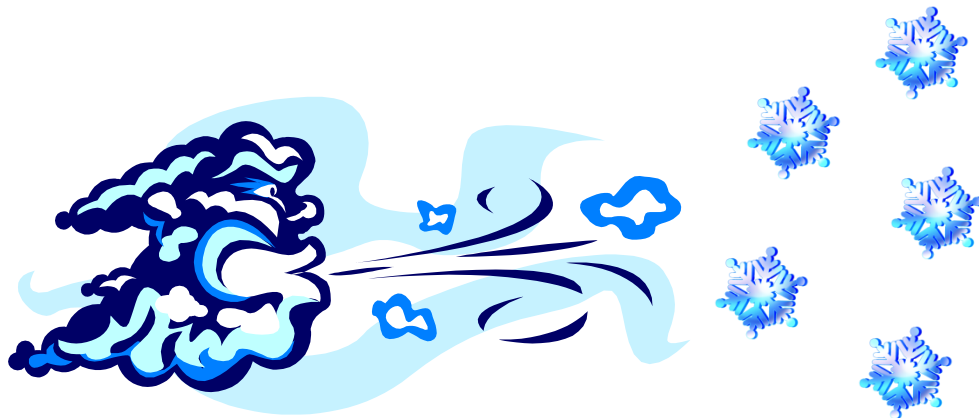
1. Quality Requirements
2. Test Methods
3. Handling, Transportation & Storing
4. Refilling Interface



TM

# DEF Product Characteristics

- Non-hazardous and non-toxic
- Weighs 9.1 lbs per gallon
  - Heavier than Petroleum Products
  - Bulk Load <5,000 gallons
- Will freeze at 12° F (-11°C)
- “Leaking and Creeping” tendencies



# Many Different Manufacturers...



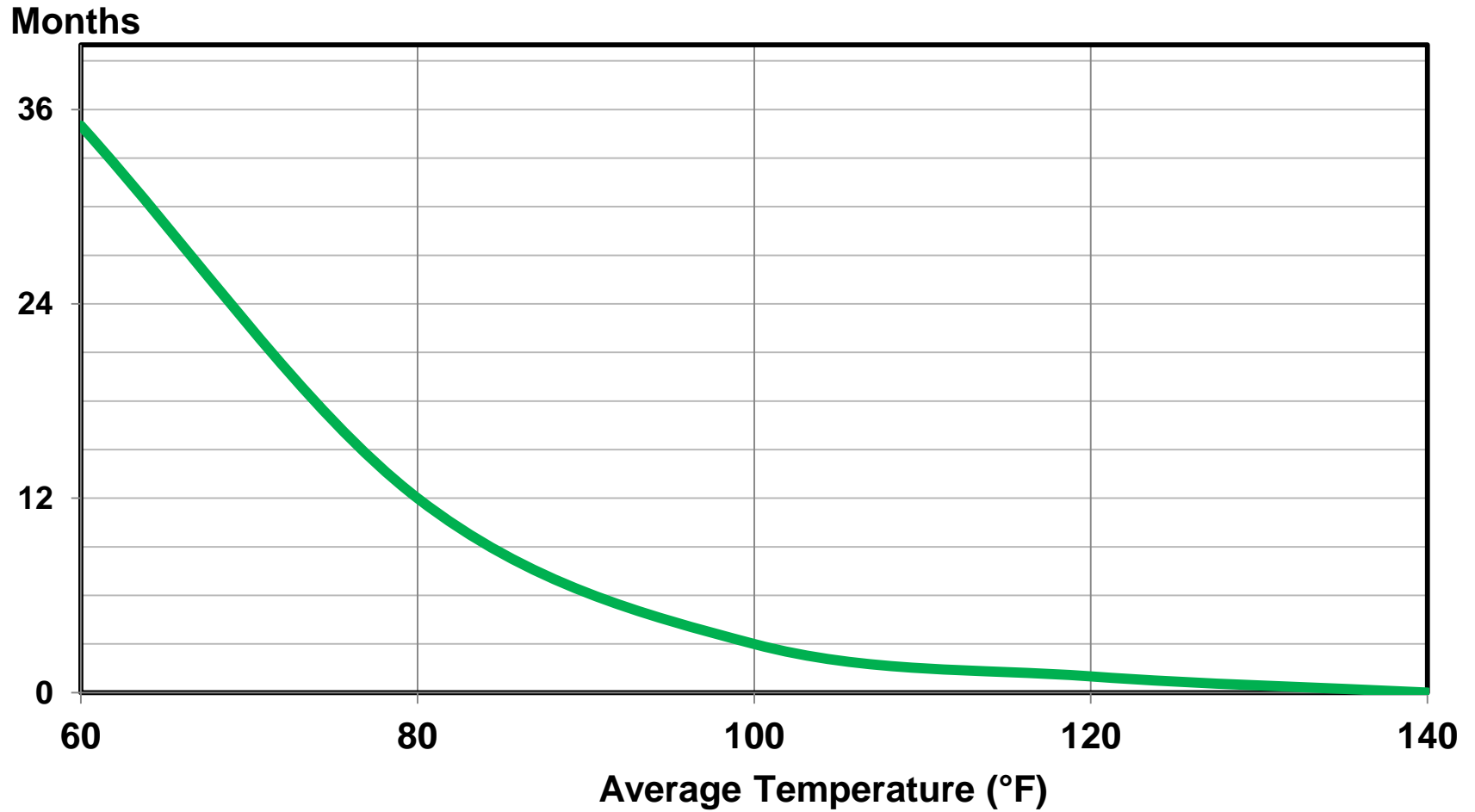
**Blue** DEF<sup>®</sup>  
DIESEL EXHAUST FLUID

**TerraCair**<sup>®</sup>  
AUS 32  
ULTRAPURE DIESEL EXHAUST FLUID





# SHELF LIFE VS TEMPERATURE



# DEF Started with Small Containers...



# DEF Progressed to Drums...



# DEF Transitioned to Totes...



# DEF Has Now Progressed to Bulk Storage...



# DEF Dispensing



# CRYSTALLIZATION ON NOZZLE IS NORMAL



# Where does it go in the Vehicle?





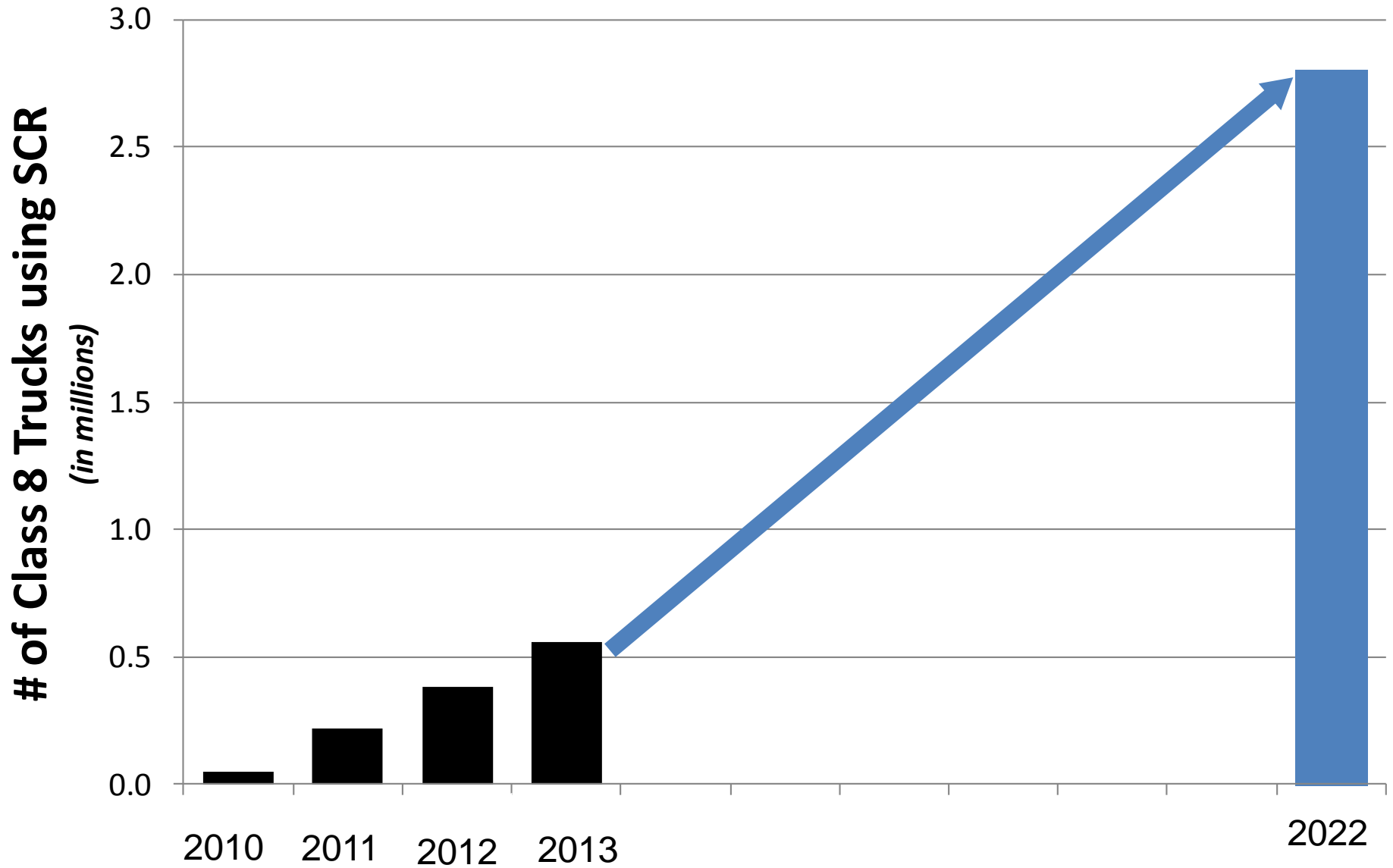
# Instrumentation



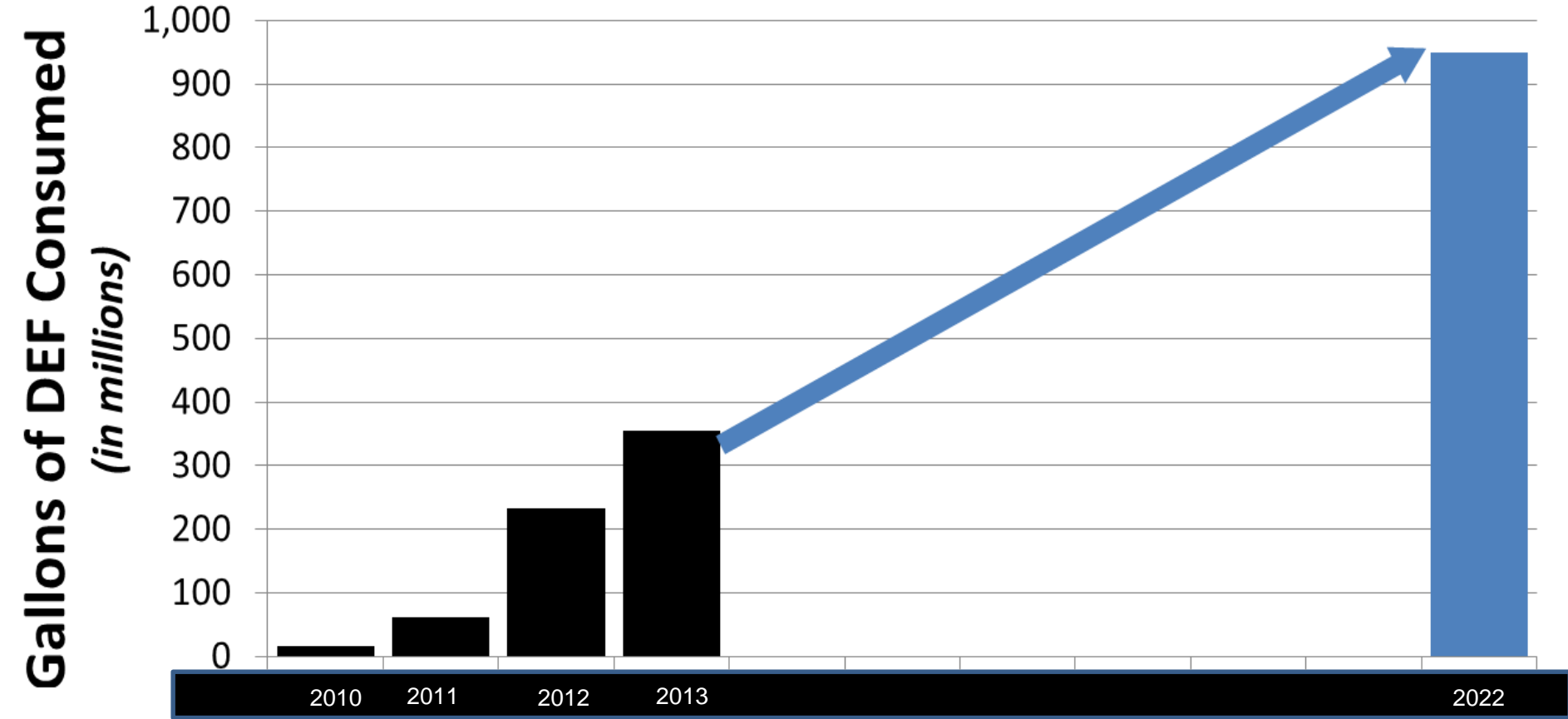
# Washington DC, 2013...



# Market Update - CL8 SCR Vehicles



# DEF Consumption

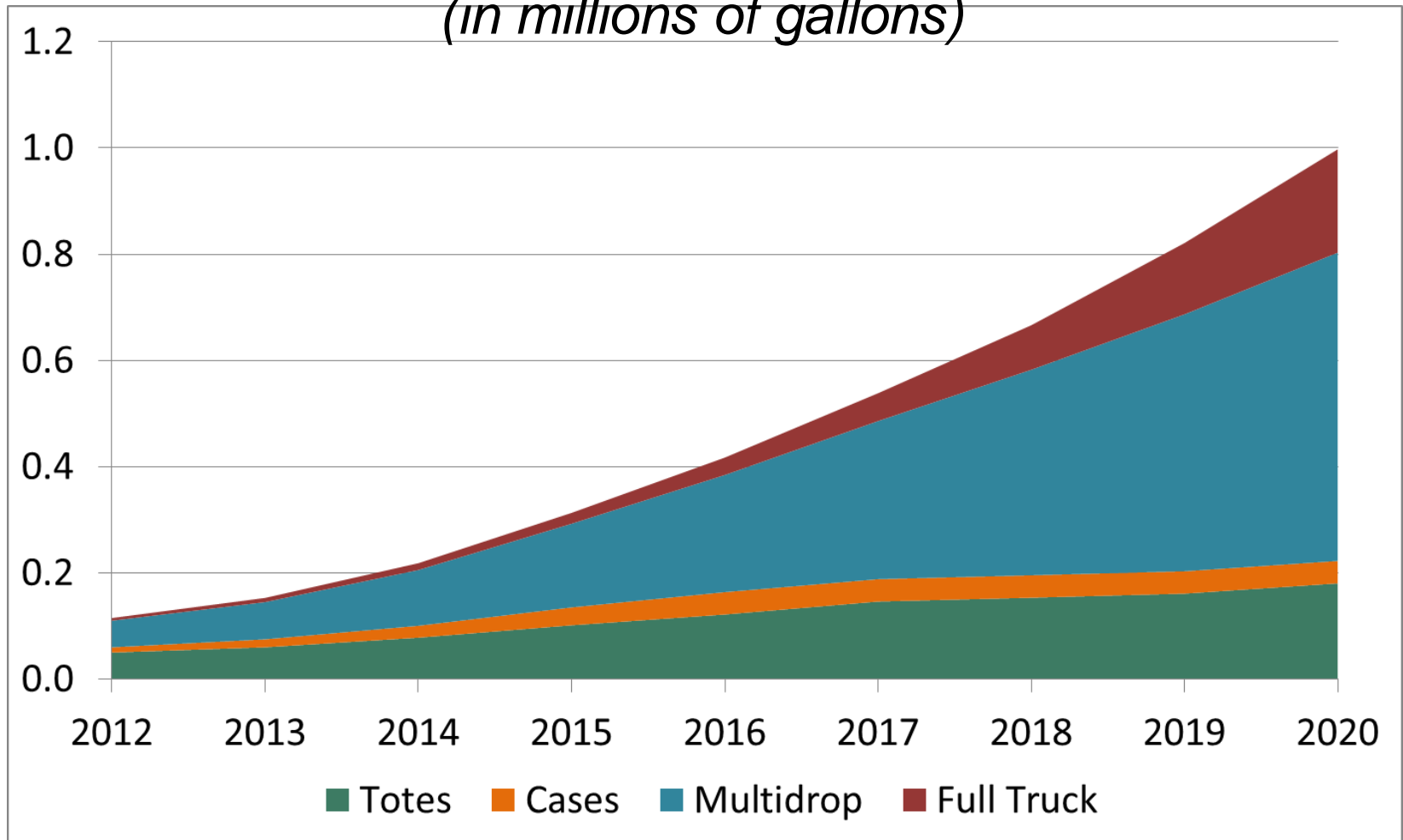


# DEF Equipment Forecast

- Majority of market will be multidrop (minibulk) = Blue1 market strength

## DEF Volume by Delivery Format

*(in millions of gallons)*



# BLUE1USA Equipment Mini-Bulk Systems



# BLUE1USA Equipment

## Tote Cabinets



# BLUE1USA Equipment



**Dispensers  
and Pumps**



# BLUE1USA Equipment

## Bulk Storage



# BLUE1USA Equipment Commercial Mini-Bulks



- BUILT-IN DISPENSER

- COMPATIBLE W/ ALL CARD READERS

- NARROW FOOTPRINT W/ 500, 750, & 1,000 GAL SIZES

# BLUE1USA Equipment

## Remote Mini-Bulks

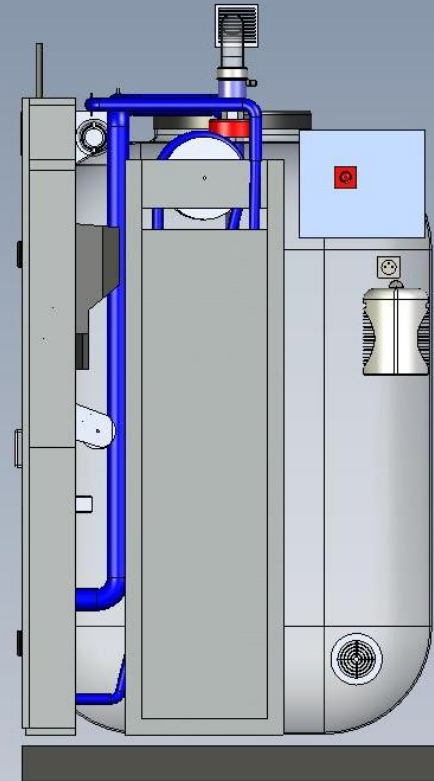
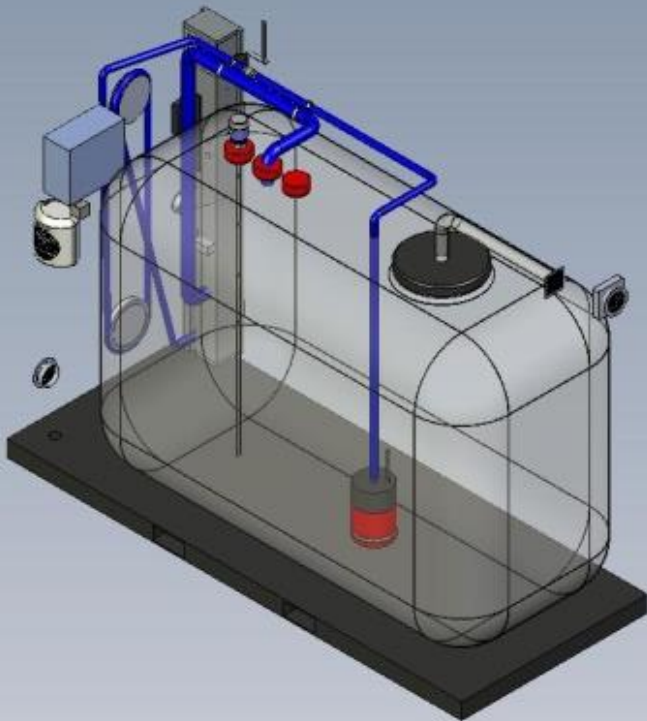
- INTEGRATES w/ ANY 3<sup>RD</sup> PARTY DISPENSER
- AVAILABLE W/ ECONOMICAL LEVELING FRAME
- 500 - 3,400 GALLON SIZES



# BLUE1USA Equipment

## Mini-Bulk Construction

- Primary poly tank w/ secondary containment
- Insulated exterior made of 100% composite materials
- Stainless Steel Piping
- Turn-key, pre-wired components



# Blue1Box



- **Insulated & Non-Insulated**
- **Narrow, Compact Footprint**
- **1,000 Gal Capacity**
- **Economical**
- **Perfect for Commercial Fleets**



# BLUE1USA Equipment

## Tote Cabinets



# BLUE1USA Equipment Tote Cabinets



**Non-Insulated**



**Insulated Exterior**

# Blue1USA DEF Dispensers



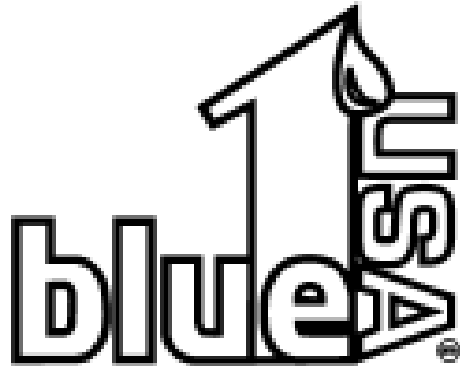


# Bulk Storage Solutions

**SITE SPECIFIC PRICING**  
**Bulk Storage, 3,000 to 8,400 Gals**



# CERTIFIED TO UL & CSA ELECTRICAL STANDARDS



Blue1USA  
3883 Rogers Bridge Rd.  
Suite 205-A  
Duluth, GA 30097  
770-688-1958  
[www.blue1usa.com](http://www.blue1usa.com)



**Model:** DEF Mini-Bulk  
**Electrical:** 120/240 V  
30 A  
60 Hz

**Unit Serial Number:**

*Conforms To:*  
**UL 508**

*Certified To:*

**CSA C22.2 No14-10**



# Underground Options for DEF Storage



# WHAT SIZE STORAGE FACILITY DO I NEED?

## DEF STORAGE SYSTEMS

### STORAGE CAPACITY MATRIX AND CALCULATOR

SCR VEHICLES		DEF USAGE PER PERIOD			
# VEH	DIESEL GAL/WK	WEEK	MONTH	QUARTER	YEAR
1	385	12	50	150	600
3	1,154	35	150	450	1,800
5	1,923	58	250	750	3,000
8	3,077	92	400	1,200	4,800
10	3,846	115	500	1,500	6,000
13	5,000	150	650	1,950	7,800
26	10,000	300	1,300	3,900	15,600
40	15,385	462	2,000	6,000	24,000
50	19,231	577	2,500	7,500	30,000
80	30,769	923	4,000	12,000	48,000
100	38,462	1,154	5,000	15,000	60,000

120,000	Miles Per Year
6.00	MPG
3%	% DEF per gallon of Diesel

RECOMMENDED STORAGE CAPACITY	DEF USAGE PER PERIOD (GALLONS)			
	WEEK	MONTH	QUARTER	YEAR
55 gal Drum	20+	80+	240+	960+
275 gal Tote	80+	350+	1,400+	5,600+
1,000 - 5,000 gal Mini-Bulk Storage System	160+	700+	2,800+	11,000+
8,000+ Bulk Storage	1,375+	5,500+	15,500+	62,000+

YELLOW HIGHLIGHTED CELLS CAN BE MODIFIED BY USER

# Who is Blue1USA?

- Manufacturer of DEF storage & dispensing equipment
- Providing fleet fueling solutions since 1998
- Corporate Office in Duluth Georgia.
- Manufacturing facility in Little Rock, AR



# Customers



**Kwik Trip**



**Love's Travel Centers**

# National Distributor Network

## Service and Product Support

- 50 States
- 100 + Branches
- 600 + Service Technicians
- Parts & Service Support



# Questions?

