Premium Diesel Additive
Winter Treatment

Report Outline

- Premium Diesel Performance
  - Lubricity
  - Cetane Number
  - Corrosion
  - Fuel Detergency
  - Fuel Economy
  - Cold Weather Performance
  - Fuel Stability
- Conclusions

Diesel Fuel Lubricity

Lubricity Requirement

- Lubricity is required to protect fuel injection systems
- Lubricity is measured as a function of wear
  - Measured by ASTM D 6079 – High Frequency Reciprocating Rig (HFRR)

Lubricity Requirement

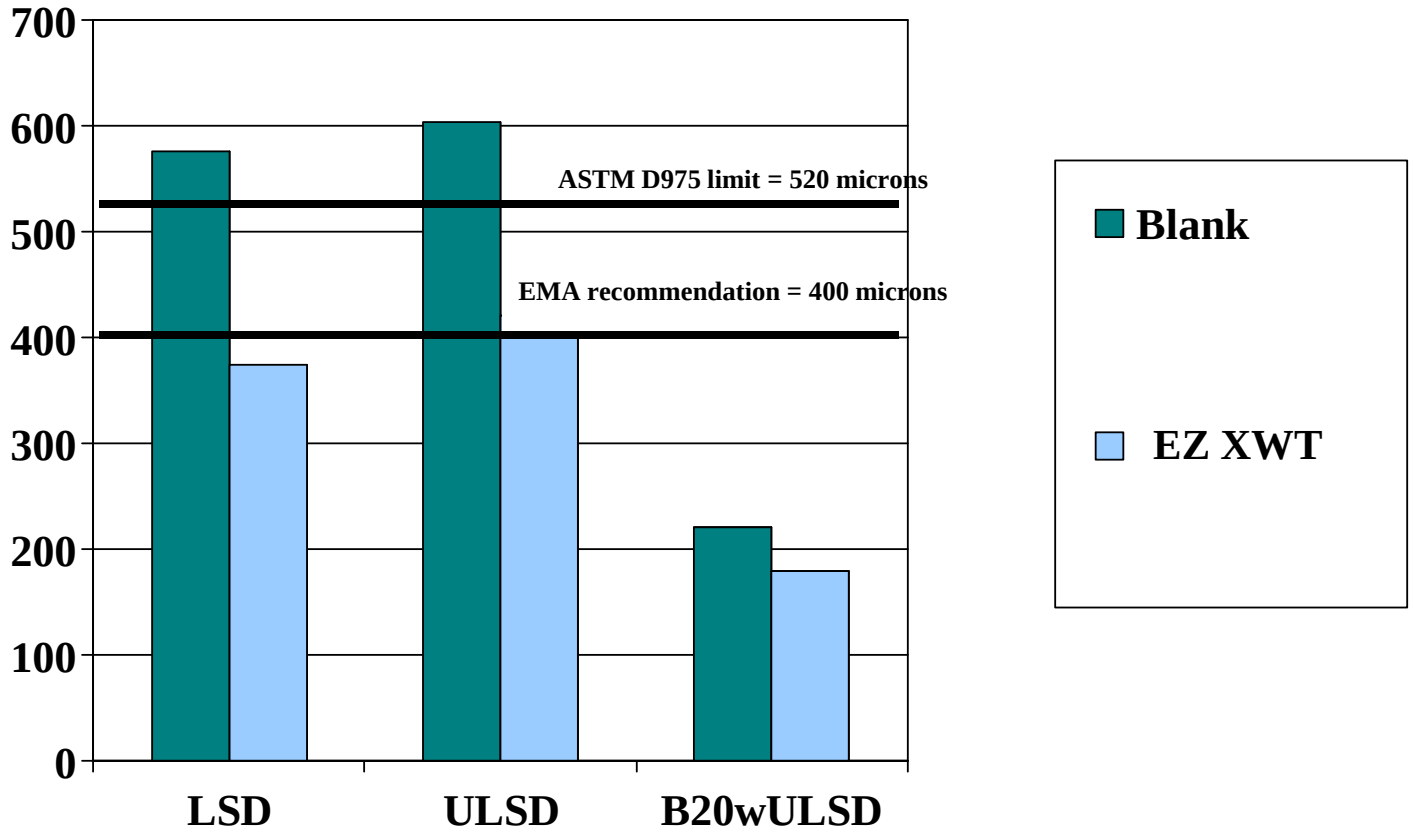
- As of 01/01/2005 ASTM D975 requires wear scar diameter less than 520 microns
  - Enforcement of ASTM D975 is at the State level. ASTM has no enforcement authority
  - At least 26 states require diesel fuel to meet ASTM D 975. See map on next slide

ASTM D975 Enforcement by State

Arkansas
California
Colorado
Connecticut
Delaware
Florida
Idaho
Illinois
Iowa
Kansas
Louisiana
Maryland
Michigan
Mississippi
Missouri
Montana
Nevada
New Hampshire
New Mexico
North Carolina
Oklahoma
South Carolina
Tennessee
Washington
West Virginia
Wyoming

Reference: Al Mannato, API SD Conference, June 14, 2006 Washington, DC

Lubricity Requirement



EZ XWT will help meet or exceed the Engine Manufacturers Association recommended lubricity protection level

Lubricity Benefits of EZ XWT

- Enhances performance of fuels with poor lubricity characteristics
- Increases service life of fuel handling and metering systems
- Performs well on industry lubricity tests
- Demonstrates minimal interaction with basic system contaminates (lube oils and caustics)
- Demonstrates excellent tolerance to water contamination
- Does not contribute to combustion deposits

EZ XWT meets "No Harm" requirements of diesel fuel additives

Cetane Number

Cetane Number

- High cetane fuels burn with a shorter ignition delay and lower peak pressure
- High cetane fuels typically burn with less smoke and odor
- Helps eliminate pre-ignition
- Cold temperature starting is improved with high cetane fuels

Cetane Number Improvement

Fuel	Baseline Cetane #	EZ XWT Cetane #
Pipeline Spec/LSD	40	44
ULSD	40	44

EZ XWT can increase Cetane Number by up to 4 numbers

Corrosion Protection

Corrosion Protection

Fuel mixture	NACE Rating
LSD blank	C
ULSD blank	C
LSD with EZ XWT	A
ULSD with EZ XWT	A

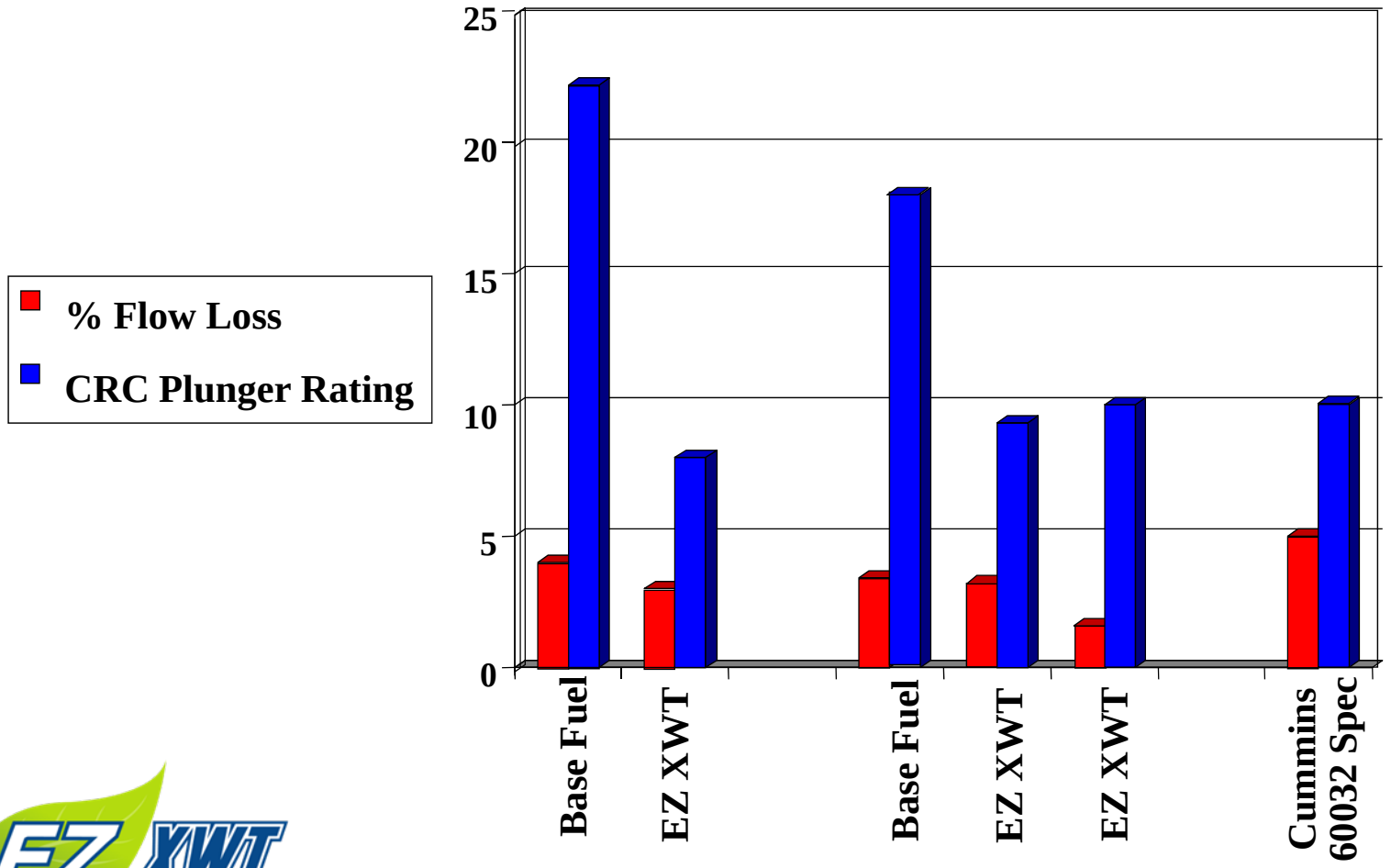
EZ XWT improves the corrosion protection of diesel fuel

Fuel Detergency

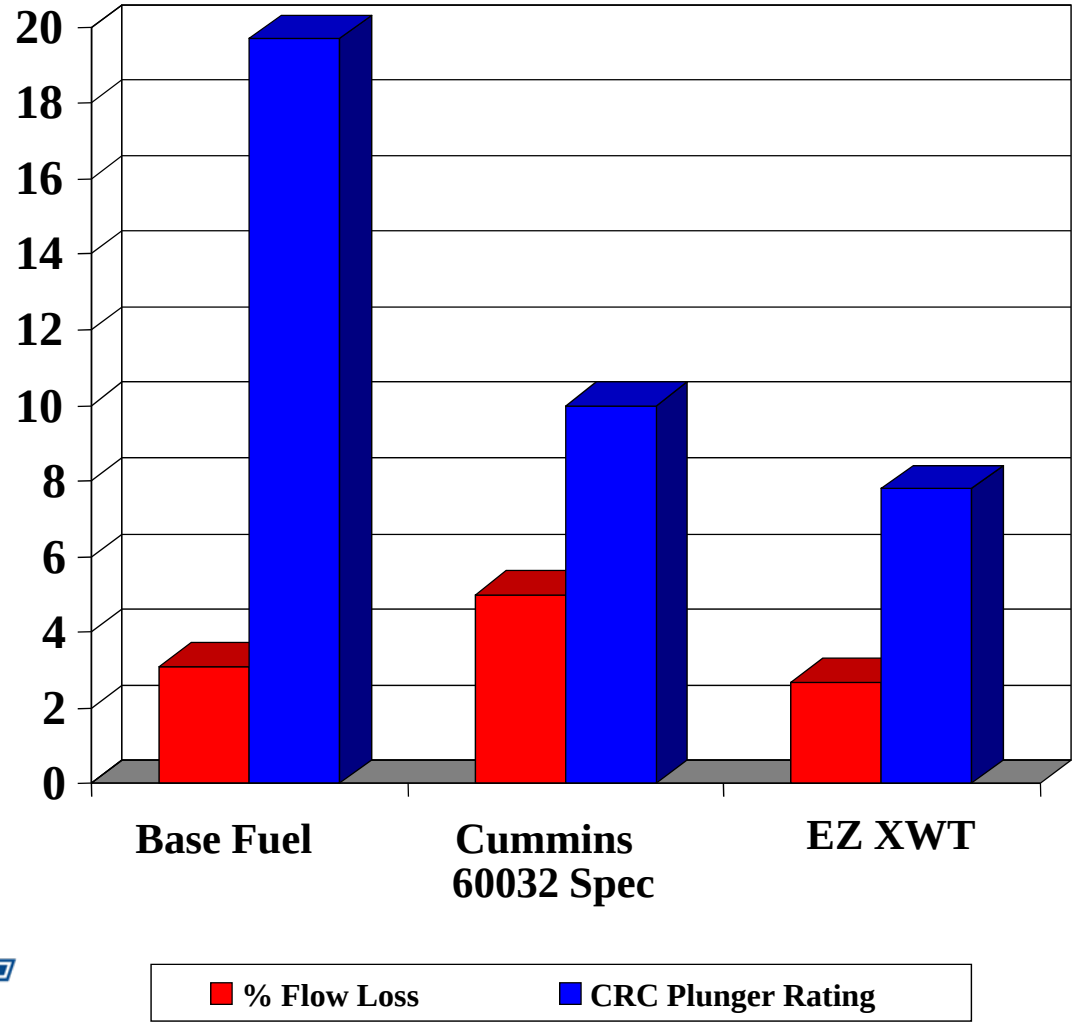
Fuel Detergency

- Detergents are used in diesel fuel to help control deposit and gum formation on fuel injector nozzles and act to prevent corrosion of nozzle ports
- Use of detergents in new engine technologies introduced since 2007 is growing in importance because of higher pressures, higher temperatures, and tighter tolerances

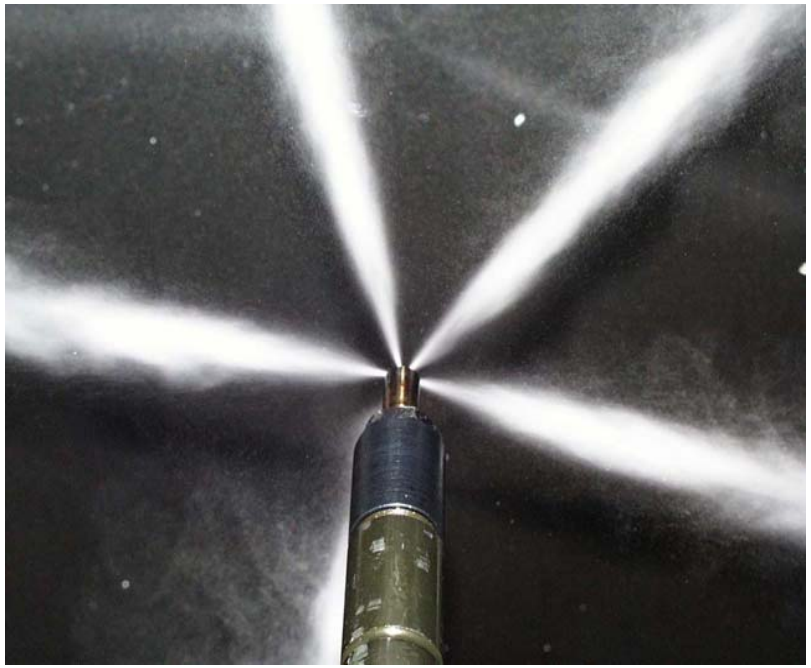
CUMMINS L-10
125 HOUR INJECTOR DEPOSITING TEST



CUMMINS L-10
125 HOUR INJECTOR DEPOSITING TEST

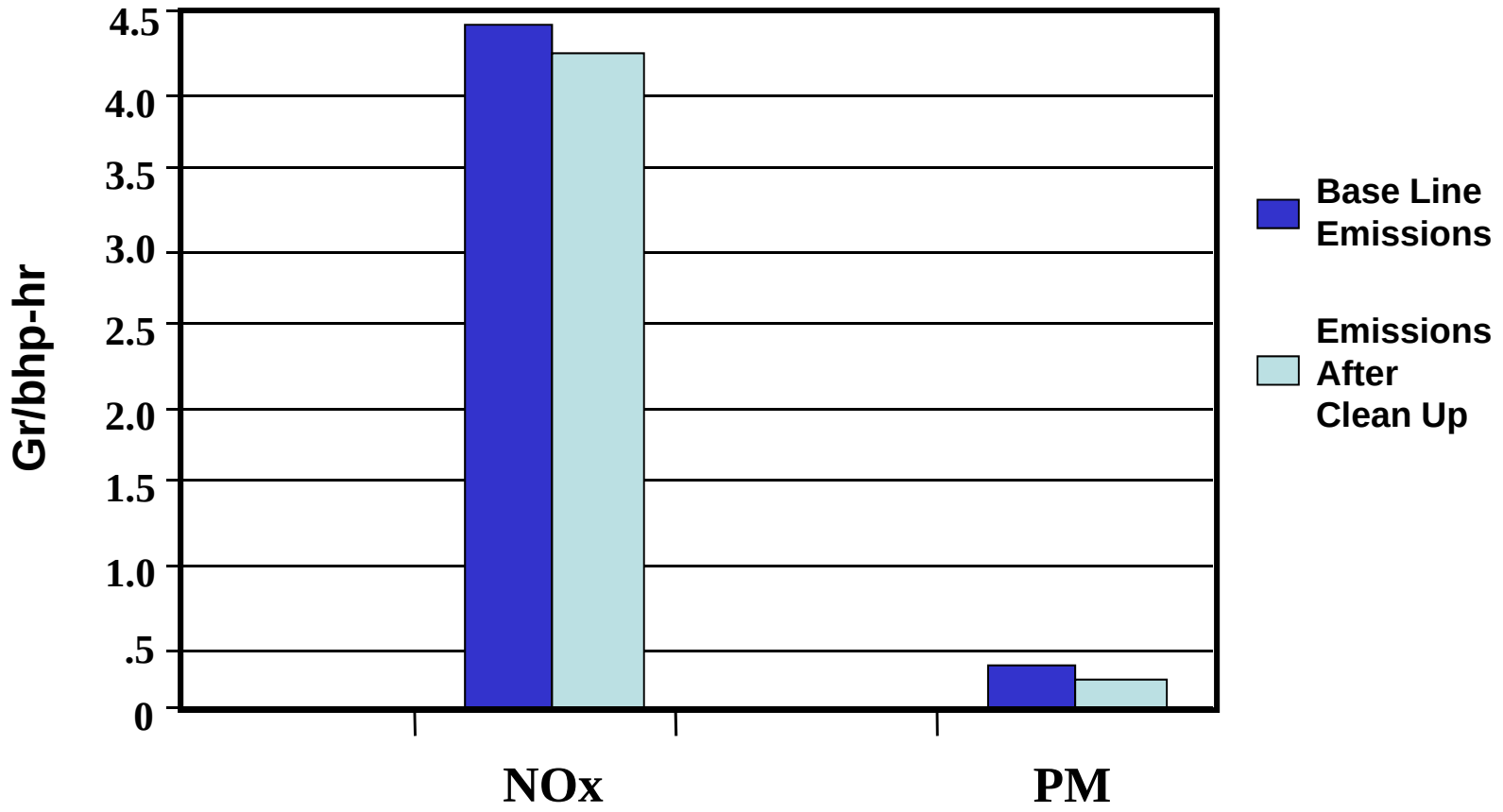


Fouled Direct Injector



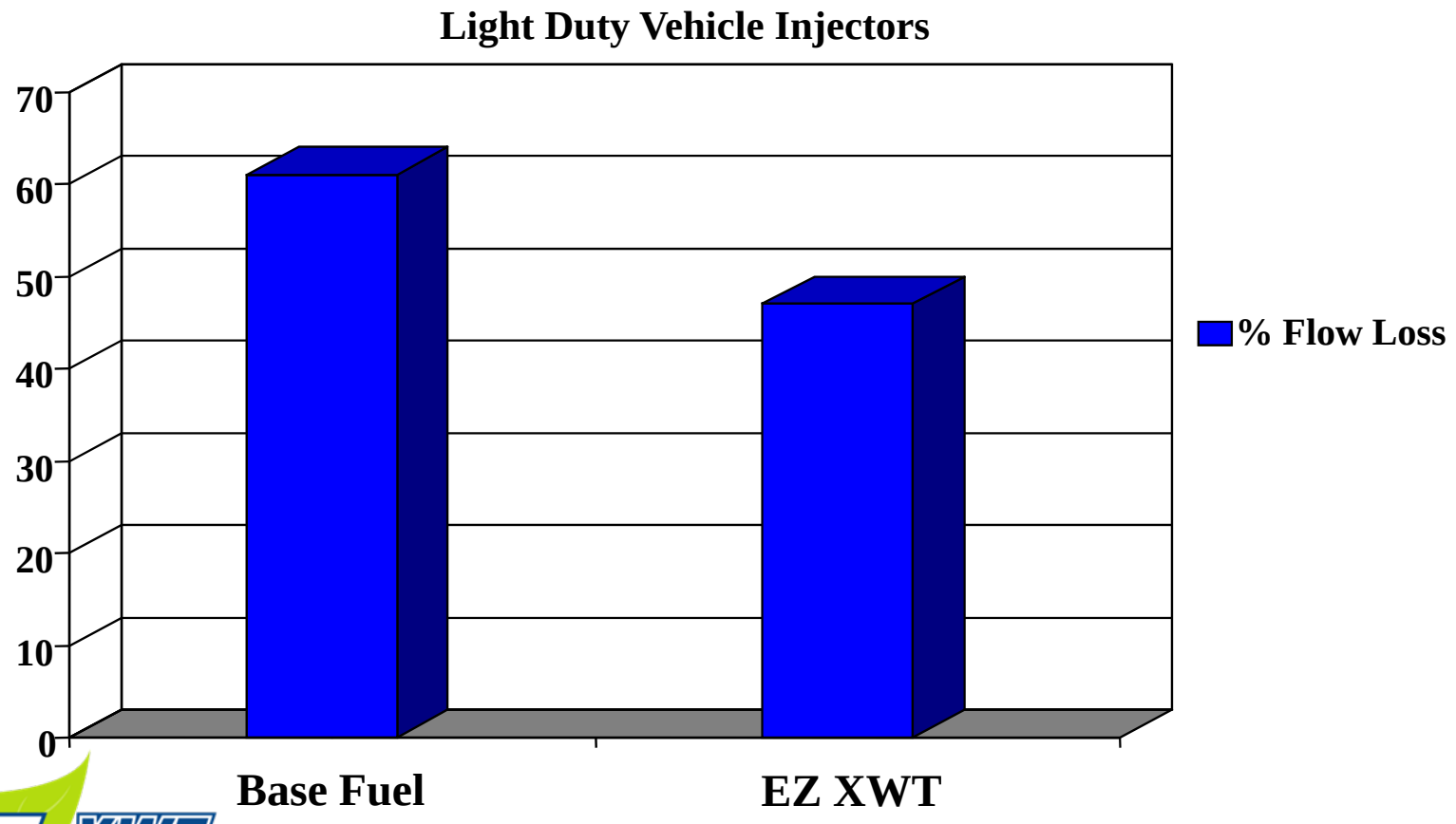
Clean Direct Injector

Cummins L-10 Emissions Test Data

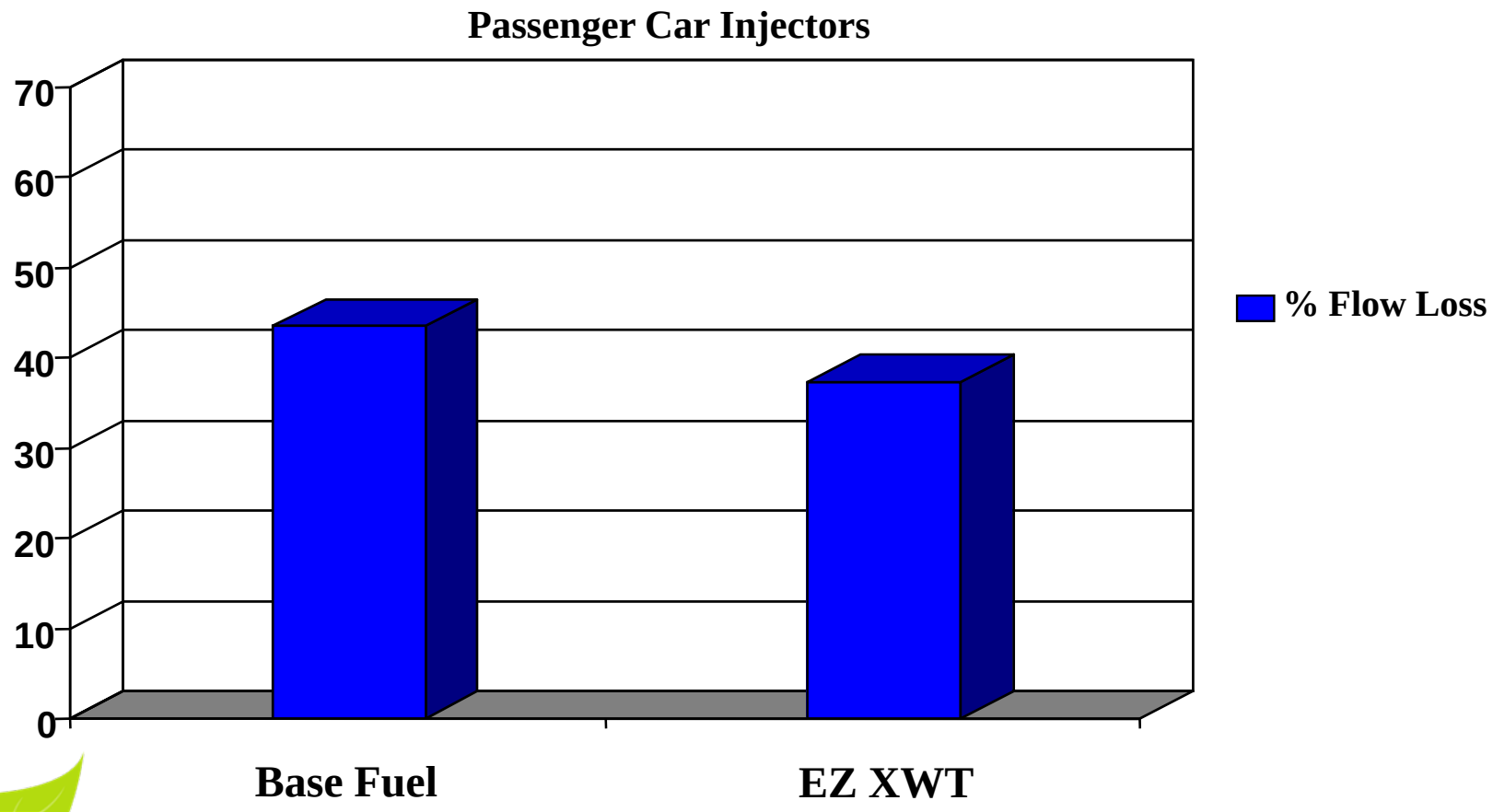


EZ XWT reduces emissions after clean up

Daimler Benz OM-616 Nozzle Coking Test



Mercedes Benz OM-602A Nozzle Coking Test



Fuel Economy Testing

Fuel Economy

- Oronite's testing of ODA 78012, the detergent used in EZ XWT includes:
  - Testing in Cummins L10 test engine
  - US field testing in heavy duty truck fleet
  - European field testing in light duty diesel fleet

Fuel Economy

- Testing in Cummins L10 test engine
  - Baseline (clean) injectors were 4.5% more fuel efficient than “worst-case” (dirty) injectors
  - Fuel economy improvement of 1.2% was observed in an engine with dirty injectors using 600 gallons of diesel treated with ODA 78012 at clean up treat rate.
  - Injectors showed 9.5% CRC injector rating improvement and 8.0% injector flow rate improvement during clean-up test cycle

Fuel Economy

- US field testing
  - Heavy-duty truck fleet of 28 vehicles over a 2.5 year period
  - Fuel injectors used comprise ~ 90% of all on-highway, Class 8 vehicles
  - Individual trucks showed as much as 4.6% fuel economy improvement over base line mpg without ODA 78012

Fuel Economy

- European testing
  - Two light duty fleets
  - 10 different vehicle types
  - 14 vehicles
  - Base line mileage was established in fuel without ODA 78012
  - In one fleet, some vehicles achieved as much as a 14.7% improvement in miles per gallon
  - In the other fleet, some vehicles achieved as much as 10.3% improvement in miles per gallon

Fuel Economy

- Using ODA 78012 at the level formulated in EZ XWT can restore lost fuel economy as a result of “cleaning up” injectors

Cold Weather Performance

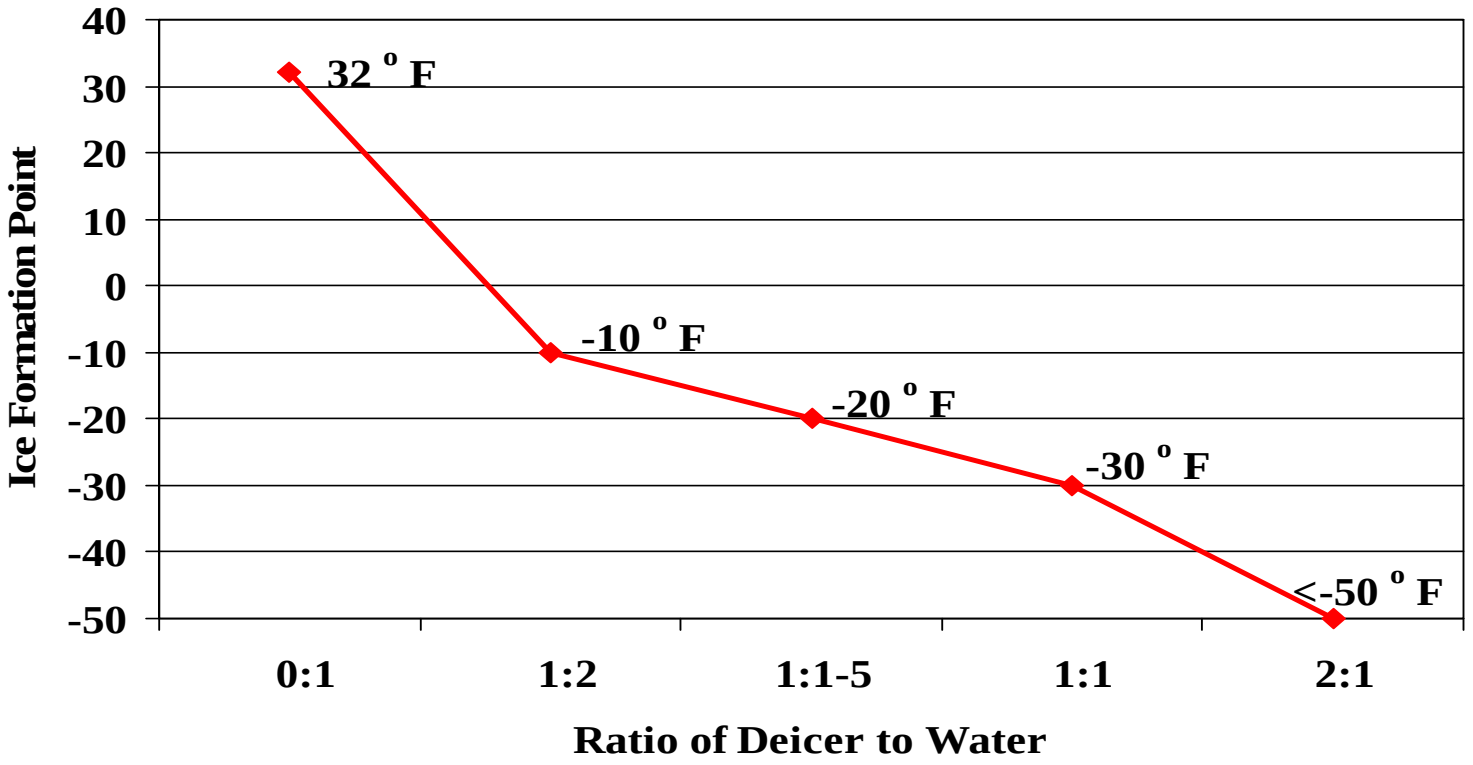
Low Temperature Performance

Blend	Pour Point, ºF	CFPP, ºF*
ULSD Baseline	-1	10
ULSD/EZ XWT	-36	-22

*** CFPP = Cold Filter Plugging Point**

EZ XWT improves low temperature characteristics of diesel fuel

Diesel Fuel Deicer Performance



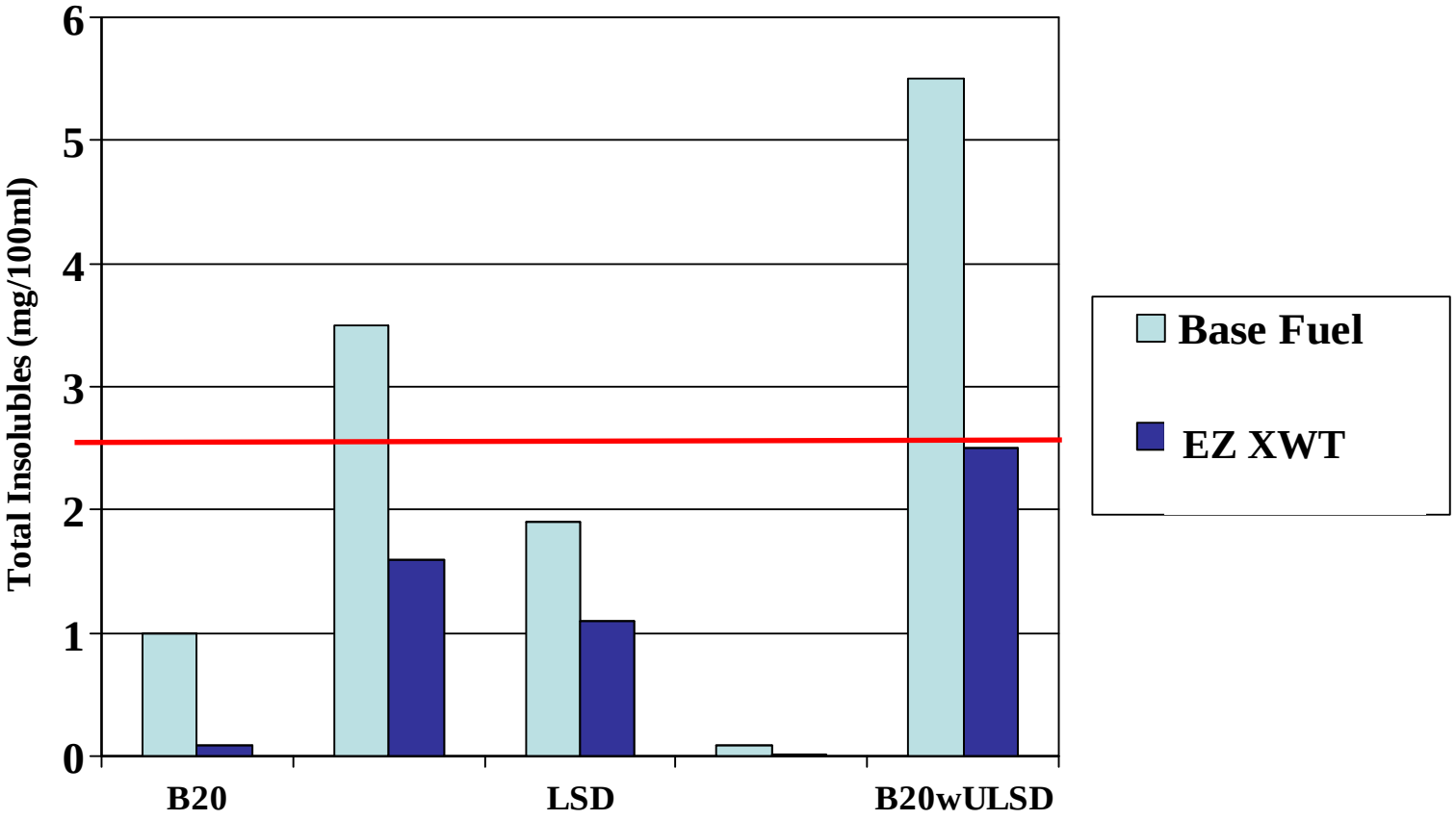
EZ XWT is effective in reducing or eliminating ice crystal formation

Diesel Fuel Stability

Diesel Fuel Stability

- Thermal Stability
  - Unstable fuels will turn dark and produce gum forming residues. Filter plugging and poor performance will follow. Stabilizers can be added to prevent this degradation

Oxidation Stability (ASTM D2274)



EZ XWT can improve the storage stability of diesel fuel

Conclusions

- EZ XWT can ….
  - Help meet the lubricity requirements suggested by the OEMs
  - Improve Cetane Number by up to 4 numbers
  - Provide engine clean up and keep clean performance
  - Restore lost fuel economy
  - Reduce emissions

Conclusions

- EZ XWT can ….
  - Provide excellent corrosion protection
  - Reduce Pour Point by up to 35 degrees
  - Reduce CFPP by up to 32 degrees
  - Provide deicing protection down to -50^{o} F
  - Improve fuel stability

Other Products

- For premium fuel performance during the summer months, use EZ XST
- EZ XST has all the same quality components as EZ XWT except for the cold flow improvers and deicers

Other Products

- EZ ADD Onboard Additive Metering System
  - the basic EZ ADD system is designed for equipment that is fueled “on the road.” EZ ADD determines how much fuel is added during a fuelling stop and adds the appropriate amount of additive to the fuel tanks. EZ ADD can be mounted to individual tractor trucks, straight trucks, garbage and concrete trucks, transit buses, etc. and off-road construction and mining equipment. Installation is simple and can be completed with simple hand tools.
  - No more hand measuring, splash blending, additive spills, smelly hands
  - Have confidence that additive needs are being met accurately and consistently and receive full benefit from additive expenditures

Contact Information

2632 Pamlico Drive
Shelby, NC 28152
Mobile: 704-477-0105
Fax: 1-888-393-0835
Email: robert@ezadd.biz
Website: www.ezadd.biz