2014-2015 CENEX® WINTER FUELS PRODUCTS & BEST PRACTICES FOR HANDLING

Fueling Innovation for Enhanced Performance.

TABLE OF CONTENTS

BEST PRACTICES

Best Practices for Handling Diesel Fuel in Winter Weather

Proper tank maintenance and fuel handling helps ensure your fuel supply stays clean and fresh in your storage tank — and remains that way until it reaches your fuel system. By following the tips and information in this guide, you can avoid most common cold-weather problems, and ensure reliable travels through the most challenging season of the year.

Be mindful of these key issues before cold weather strikes, and keep your customers informed, too:

- The true measure of your diesel fuel's cold weather performance is measured by operability, cloud point (CP), cold filter plugging point (CFPP) and the cetane number.
- Ultra Low Sulfur Diesel Fuel (ULSD) has different cold flow characteristics than Low Sulfur Diesel Fuel (LSD).
- There is a proper way to blend diesel fuels, biofuels and fuel additives.
- Proper tank maintenance and fuel filtration is a critical step to ensure your customer's fuel operates at optimal levels.
  Fuel handling and tank maintenance must be done properly. You can avoid most common cold weather problems, and ensure reliable performance year-round.
- Proper use of cold flow improvers can extend operability of fuels by:
  Changing the diesel fuel wax structure utilizing wax dispersants.
  Dispersing wax, thus keeping wax crystals from congregating in the fuel.
- In order to understand fuel performance issues, a complete analysis of the fuel inside a storage tank is required; following the correct sequence and having the proper fuel sampling equipment is crucial.
- In the event of a winter fuels failure, it is essential to get as much information as possible by asking the proper questions and taking fuel samples for analysis.

CENEX® WINTER FUELS TERMINAL AVAILABILITY

• Available • Availability coming soon • Winter Aid IV

State	City	Wintermaster	Roadmaster XL / Ruby Fieldmaster SE*	#1 Diesel w / CPDA**	Roadmaster XL / Ruby Fieldmaster w/ WA IV† or CFI‡	ULSD #2 w/ WA IV† or CFI‡
CO	Denver (Aurora)		•	•	•	•
IA	Bettendorf (Noble)			•	•	•
IA	Council Bluffs (NCRA)			•	•	•
IA	Des Moines		•	•	•	•
IA	Fort Dodge				•	•
IA	Iowa City		•	•	•	•
IA	LeMars				•	•
IA	Mason City	•	•	•	•	•
IA	Milford (MGL)	•	•	•	•	•
IA	Milford (Nustar)				•	•
IA	Rock Rapids				•	•
IA	Sioux City		•	•	•	•
IA	Waterloo		•	•	•	•
IL	Rockford (Marathon)			•		
KS	Concordia (Delphos)		•	•	•	•
KS	Great Bend				•	•
KS	Hutchinson				•	•
KS	Kansas City		•	•	•	•
KS	McPherson (NCRA)			•	•	
KS	Scott City		•	•	•	•
KS	Topeka				•	•
MN	Alexandria	•	•	•	•	•
MN	Mankato	•	•	•	•	•
MN	Marshall	•	•	•	•	•
MN	Minneapolis	•	•	•	•	•
MN	Rochester		•	•	•	•
MN	Wrenshall			•	•	•
MO	Carrollton (Sinclair)			•		
MO	Columbia		•	•	•	•
MO	Palmyra				•	•
MT	Glendive	•	•	•	•	•
MT	Great Falls	•	•	•	•	•
MT	Laurel	•	•	•	•	•
MT	Logan	•	•	•	•	•
MT	Missoula	•	•	•	•	•
ND	Fargo	•	•	•	•	•
ND	Grand Forks	•	•	•	•	•
ND	Jamestown - East		•	•	•	•
ND	Minot	•	•	•	•	•
NE	Columbus		•	•	•	•
NE	Doniphan		•	•	•	•
NE	Geneva		•	•	•	•
NE	Lincoln (P66 & MGL)				•	•
NE	Norfolk		•	•	•	•
NE	North Platte		•	•	•	•
NE	Osceola		•	•	•	•
OK	Enid				•	•
OK	Oklahoma City (Reno)				•	•
SD	Aberdeen		•	•	•	•
SD	Mitchell		•	•	•	•
SD	Rapid City			•	•	•
SD	Sioux Falls (MGL)		•	•	•	•
SD	Sioux Falls (NuStar)		•	•	•	•
SD	Watertown		•	•	•	•
SD	Wolsey		•	•	•	•
SD	Yankton		•	•	•	•
TX	Amarillo				•	•
WI	Chippewa Falls	•	•	•	•	•
WI	Green Bay (Marathon)	•	•		•	•
WI	Junction City (FHR)			•		
WI	McFarland	•	•	•	•	•
WI	Waupun (FHR)			•		
WY	Cheyenne			•	•	•

Kerosene Terminals – Kerosene will be available at the Murphy terminal in Superior, WI, St. Paul Park, MN and Coffeyville, KS. Availability subject to physical outages, terminal maintenance, etc.

*Seasonally Enhanced **Cenex Premium Diesel Additive †Winter Aid IV ‡Cold Flow Improver

CENEX® WINTERIZED PREMIUM DIESEL FUELS

CENEX WINTERMASTER
Winterized Premium Diesel Fuel

Cenex® Wintermaster® Premium Diesel is formulated with an operability of -30°F and a cold filter plugging point (CFPP) of -55°F. Cenex Wintermaster is specifically formulated for the demands of diesel powered equipment in the most extreme winter conditions.

CENEX ROADMASTER XL
SEASONALLY ENHANCED HIGHWAY PREMIUM DIESEL FUEL

CENEX RUBY FIELDMASTER
SEASONALLY ENHANCED OFF-ROAD PREMIUM DIESEL FUEL

Cenex Roadmaster XL® and Ruby Fieldmaster® Seasonally Enhanced Premium Diesel Fuels are formulated for moderate climates and provide outstanding shoulder season flexibility. Cenex Seasonally Enhanced Premium Diesel Fuels deliver a cold filter plugging point (CFPP) of -25°F.

CENEX TOTAL PROTECTION PLAN
WARRANTY 10 YEARS
PREMIUM DIESEL • LUBRICANTS

#1 Diesel Fuel with Cenex Premium Diesel Fuel Additive is used to blend down your Cenex Premium Diesel Fuel tanks during transition from summer to fall/winter, helping ensure additives remain at proper levels. Ideal for blending down bulk tanks, retail fueling site tanks and customer storage tanks.

And like all Cenex Premium Diesel Fuels, our winter lineup meets the requirements for Cenex TPP® Warranty coverage in agricultural equipment.

Cenex Premium Diesel with Winter Aid IV or Cold Flow Additive

Cenex Roadmaster XL and Ruby Fieldmaster with Winter Aid IV contain de-icers and Wax Anti-Settling Agents (WASA) to help extend the operability of the fuel. The manifest from these terminals will reference "WA IV."

CENEX® WINTERIZED PREMIUM DIESEL FUELS COMPARISON CHART

ATTRIBUTES / BENEFITS	Cenex® Wintermaster™	Cenex RMXL® SE* Cenex RFM® SE†	#1 Diesel with CPDA‡
CFPP	-55°	-25°	**
Operability °F	-30°	**	**
Optimizes performance in all diesel engines	√	√	√
Improves fuel economy by as much as 5%	√	√	
Increases fuel lubricity by 10-15%	√	√	√
Improves power by up to 4.5%	√	√	
Typical Cetane Number	48	48	43
Extends life of injectors / injector pumps	√	√	√
Reduces downtime and maintenance costs	√	√	√
Performs better than standard diesel fuels in modern diesel engines	√	√	√

ADDITIVE PACKAGE COMPONENTS	Cenex Wintermaster	Cenex RMXL® SE* Cenex RFM® SE†	#1 Diesel with CPDA‡
Injection Stabilizer	√	√	√
Lubricity Improver	√	√	√
Demulsifiers	√	√	√
Storage Stabilizers	√	√	√
Corrosion Inhibitors	√	√	√
Detergents	√	√	√
Cetane Improver	√	√	√

* **Cenex RMXL® SE** — Cenex Roadmaster XL® Seasonally Enhanced Premium Diesel Fuel

**Contact your authorized Cenex Premium Diesel Distributor.

† **Cenex RFM® SE** — Cenex Ruby Fieldmaster® Seasonally Enhanced Premium Diesel Fuel

‡ **CPDA** — Cenex Premium Diesel Additive package

HOW CENEX® PREMIUM DIESEL FUELS WORK

Not all "winterized" diesel fuels are the same. No other diesel fuel contains a more complete, high-quality, multifunctional additive package than Cenex Winterized Premium Diesel Fuels. It's all done to ensure you get the performance you expect from the vehicles you depend on.

FEATURE	WHAT IT DOES	HOW YOU BENEFIT
Wax Crystal Modifiers*	Wax crystal modifiers change the size and shape of wax crystals, preventing them from bonding together. • Wax crystals stay small enough to flow through the fuel filter. • They create a porous wax cake on the fuel filter, allowing continued fuel flow until the engine heats up.	• Significantly increased cold weather operability • Reduced downtime
De-Icers*	Dramatically lower the point at which any water in the fuel system freezes.	• Fewer moisture-related problems
Wax Anti-Settling Agents*	Reduce settling of wax crystals in vehicle tanks and above ground storage tanks, which clog filters and other fuel system components.	• Enhanced cold weather operability • Reduced downtime • Reduced maintenance costs
Injection Stabilizer	Addresses fuel oxidation problems in new engine technology fuel injectors and prevents internal diesel injector deposits (IDID) from forming deep inside high-precision injectors.	• Less filter and injector replacements in new engine technologies • Less downtime and maintenance costs
Detergents	Aggressive detergent components keep fuel systems clean and performing at their optimum level.	• Improved fuel efficiency (up to 5% better in comparison to a typical #2 diesel fuel) • Greater horsepower • Extended life for fuel pumps and injectors
Cetane Improver	Cetane is a measure of diesel engine startability. The higher the cetane number, the quicker the fuel will ignite. Cenex Premium Diesel Fuel has a typical cetane number of 48.	• Reduced strain on engines and electrical systems • Less downtime and maintenance cost • Quicker, more fuel-efficient starts • Smoother running engines • Better cold weather starts
Lubricity Improver	Friction-reducing agents provide 10-15% better protection against friction and wear on the fuel pump than typical #2 diesel fuel.	• Protects moving parts from excessive wear • Extended life for the fuel pump
Demulsifiers	Demulsifiers force water to the bottom of the tank, allowing for easy drainage and removal. This prevents unwanted moisture from being carried through the fuel system and reduces the volume of water entering the combustion chamber.	• Easier removal of water from storage tank • Less wear on injectors • Fewer filter replacements • Prevents algae formation in storage tanks
Corrosion Inhibitors	Provides superior corrosion protection, preventing the formation of rust on metal parts.	• Saves the cost of rebuilding injector pumps • Reduces downtime and repair costs • Slows the natural degradation of diesel fuel caused by exposure to oxygen • Prevents corrosion-caused leaks, blockages and breaks in metal parts
Storage Stabilizers	Reduces gum and varnish buildup and contains components to extend the storage life of diesel fuel.	• Tolerates temperature extremes • Extends storage life of diesel fuel by 3-6 months

*** Winter fuel additives are in Cenex® Wintermaster®, Cenex Roadmaster XL® – Seasonally Enhanced, and Ruby Fieldmaster® – Seasonally Enhanced fuels only.**

WINTERMASTER® Winterized Premium Diesel Fuel

ROADMASTER XL® SEASONALLY ENHANCED HIGHWAY PREMIUM DIESEL FUEL

RUBY FIELDMASTER® SEASONALLY ENHANCED OFF-ROAD PREMIUM DIESEL FUEL

WINTER FUELS BASICS

Cloud Point and Operability

The cloud point is the temperature at which paraffin, which is naturally present in #2 diesel fuel, begins to form cloudy wax crystals. When the fuel temperature reaches the cloud point, these wax crystals flow with the fuel, and coat the filter element. This quickly reduces the fuel flow, starving the engine.

Operability — equipment still functioning (filters not plugged).

Q. ***How can you tell if fuel has reached its cloud point?***

A. The fuel looks cloudy.

Fuel Cloud Point

Fuel and cloud point

Fuel at cold filter plugging point

The Cold Filter Plugging Point (CFPP)

The Cold Filter Plugging Point (CFPP) is the temperature when fuel will plug filters.

#1 or Y grade fuel — Typically has a cloud point and CFPP of -40°F or lower

- #1 made in the southern tier refineries typically has a cloud point of around -40°F
- #1 made in the northern tier refineries typically has a cloud point of around -60°F

#2 or X grade fuel — Pipeline terminal specification for cloud point is typically around 14°F

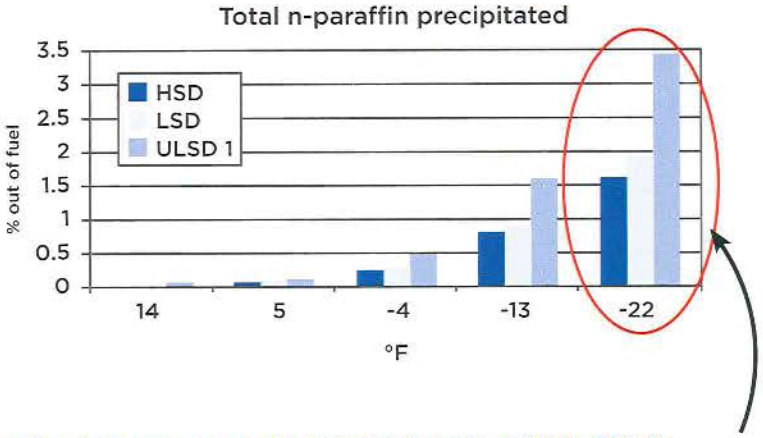
- #2 made in southern tier refineries typically has a cloud point of around 14°F
- #2 made in northern tier refineries typically has a cloud point of around 6°F

Biodiesel — Biodiesel blends may have a negative impact on the cloud point of fuel

- B2 and B5 impact is typically 2-6°F
- B10 blends and higher may have a significant impact, 10° or more

Ultra Low Sulfur Diesel Fuel (ULSD)

Ultra Low Sulfur Diesel Fuel (ULSD) —
The structure of wax in ULSD is different than low sulfur diesel fuels.



The difference in wax structure leads to more wax dropping out more quickly. This is why ULSD is more difficult to treat with cold flow improvers and why some ULSD #1 doesn't reduce the cloud point of ULSD #2 fuels as readily.

PROPER BLENDING

A primary cause of winter fuel-related problems are that tanks are not properly "blended down," meaning fuel has a higher operability than intended. Blending down a tank is done by adding #1 diesel fuel to #2 diesel fuel. This helps maintain cold weather flow characteristics, increasing the operability of fuel.

When blending down a tank, pay close attention to the amount of fuel in the tank — this is known as the "heel." It is also important to know your proper treat rate and be sure to calculate it accurately. Treat rates vary by region or climate; for more information, contact your Cenex Representative.

Example #1:

A 2,000 gallon tank has 700 gallons of fuel remaining. The proper treat rate for the region is a 50% #1 and 50% #2 blend.

Q. *How much #1 would you bring into the tank to create a 50-50 blend?*

A. 700 gallons.

Typically, a primary reason for winter fuel related problems is that tanks are not properly blended down. A common mistake, using the example above, is to bring in 700 gallons of a 50-50 blend and add it to the existing #2 fuel. That would result in a blend of 1,050 gallons of #2 and 350 gallons of #1 — or roughly a 71% #2 and 29% #1 blend.

Example #2:

Blending Cenex Premium Diesel Seasonally Enhanced Fuel

A 2,000 gallon tank has 500 gallons of Ruby Fieldmaster remaining. The proper treat rate for Cenex Premium Diesel Seasonally Enhanced Fuel is 30% #1 and 70% Ruby Fieldmaster.

Q. *How much #1 do you bring into the tank to create at 30-70 blend?*

A. 214 gallons of #1 Ruby Fieldmaster.

Example #3:

Blending Cenex Wintermaster Premium Diesel Fuel

A 2,000 gallon tank has 500 gallons of Ruby Fieldmaster remaining. The proper treat rate for Cenex Wintermaster Fuel is 70% #1 and 30% Ruby Fieldmaster.

Q. *How much #1 do you bring into the tank to create at 70-30 blend?*

A. The first delivery should be 1,166 gallons of #1 Ruby Fieldmaster before bringing in terminally blended Cenex Wintermaster Fuel.

Rule of Thumb:
Adding 10% #1 will typically reduce the cloud point of #2 fuel by 3 degrees.

Tips to Properly Blend Down Your Tank:

- If fuel in the tank is at or below its cloud point, biodiesel or cold flow additives will stratify or not blend into the fuel (causing filter plugging).
- Make sure fuel temperature is at least 10-15 degrees above cloud point before blending down.
- Adding 10% of #1 fuel typically reduces cloud point of fuel by 3 degrees.
- Note: Adding #1 fuel to a #2 fuel at or below its cloud point, or to fuel that is gelled, will not blend properly. The #1 fuel must be warm enough to raise the fuel temperature above the CFPP.

Impact of Cloud Point

When blending fuels, biofuels and additives, the cloud point of the fuel is very important. All components must be at least **10-15 degrees above their cloud point.**

Example #1:

The cloud point of a #2 fuel is 10°F.

Q. ***How do I get the cloud point to -5°F?***

A. Create a 50% #1 - 50% #2 blend.

Example #2:

A customer is taking delivery of fuel to get him through fall harvest. The fuel is delivered in late November. The customer splash blends 2% biodiesel and a cold flow additive into the fuel. Is this a good idea?

Dependent on the temperature of the ***fuel*** at the time, this can be a risky proposition. If the fuel in the tank is at or below its cloud point, the biodiesel and the cold flow additive will not blend into the fuel or stratify. When biodiesel and cold flow additives are not properly blended into the fuel, they become another contaminate for fuel filters to pick up.

WINTER BLENDING WITH BIODIESEL

When blending into a storage tank that is a blend of fuel and biodiesel, you will need to add an additional 10% of #1 fuel to compensate for the increased cloud point of the biodiesel.

- Splash blending of neat biodiesel (B100) with petroleum diesel should occur when both products are 40°F or above.
- B2 or B5 biodiesel blends typically have very similar (within 0-5°F) cloud point and CFPP characteristics to conventional diesel products and can be treated in a similar fashion to with #1 diesel blends, CFI, or both.
- Animal fat and higher level soy blends may increase the CFPP of the fuel as much as 5°F for every 10% of B100 used.
- Typically, B2 and B5 blends will increase the cloud point by 2-6°F if blended properly and the bio fuel is on spec.
- Biodiesel may also have a negative impact on CFI response in blended fuel.

AST (ABOVE GROUND STORAGE TANKS)

- ❑ Drain and remove all water and contaminants.
- ❑ Change filters and clean pump screens.
- ❑ Pre-blend #1 with existing fuel (blended above cloud point) as needed for your climate.
- ❑ Consider use of Winter Aid IV additive in existing fuels (packaged Winter Aid IV additive available from Lubricants department).

UST (UNDERGROUND STORAGE TANKS)

- ❑ Remove all water and contaminants.
- ❑ Change filters and clean pump screens.
- ❑ Pre-blend #1 with existing fuel as needed for your climate.
- ❑ Consider use of Winter Aid IV additive in existing fuels (packaged Winter Aid IV additive available from Lubricants department).
- ❑ Underground temperatures, 35 to 45°F, will keep fuel above its cloud point.

COLD FLOW IMPROVERS

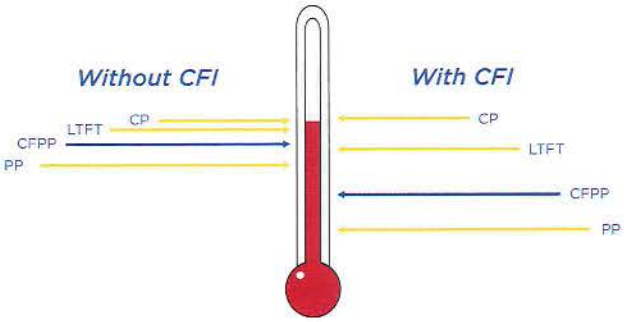
Cold flow improvers are designed to extend the operability of fuel by:

- Changing the diesel fuel wax structure utilizing wax dispersants
- Dispersing wax thus keeping wax crystals from congregating in the fuel

Cold flow additives do not reduce cloud point; using #1 diesel is the only way to reduce the cloud point of the fuel.

It is important not to rely on cold flow improvers to extend operability more than 15° below the fuel's cloud point (15 degrees delta).

Using a Cold Flow Improver (CFI) allows for operations at lower temperatures than that of unadditized / untreated fuel.



KEY:
CP — Cloud Point
LTFT — Low Temperature Flow Test
CFPP — Cold Filter Plugging Point
PP — Pour Point

1. Altering the Wax Structure of Diesel Fuel

Untreated diesel fuel wax structures are square in shape. As the fuel gets colder the wax structures get large enough to plug the fuel filters.

2. Dispersing Wax (WASA - Wax Anti-Settling Agents)

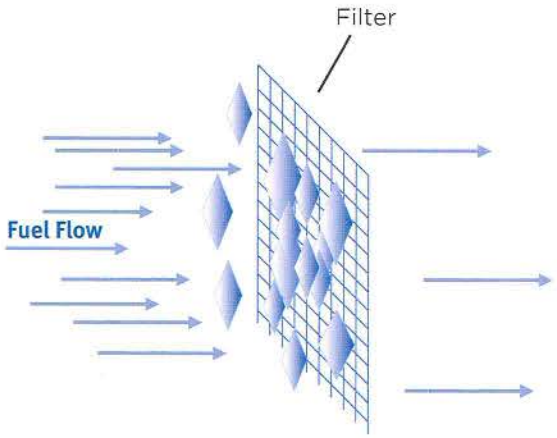
Wax dispersants extend operability by keeping wax crystals dispersed for long periods of time when fuels are stored below the fuel's cloud point.

Diesel fuel treated with a cold flow improver when the diesel fuel is 10 degrees above its cloud point will change the wax structure of the fuel to a pin-like structure. This allows the wax to pass through filters at colder temperatures (extending operability).

Cold Flow Improvers are additives that change the structure of the wax crystal, not the amount of wax. This allows the diesel fuel to operate at lower temperatures.

COLD FLOW IMPROVERS

Cold Flow Improvers – Extending Operability Wax Disposition on Filters

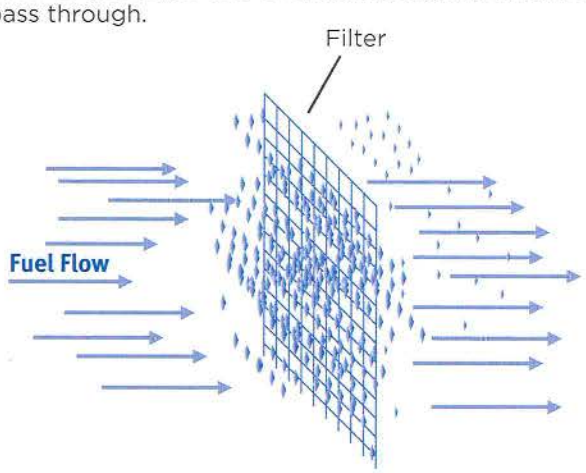


Helpful Hint:

Replace fuel filters on storage and vehicle tanks; a waterlogged filter will swell and freeze, reducing the porosity and restricting fuel flow.

Without Cold Flow Additive:

Diesel fuel structures will continue to grow as the fuel temperature decreases below the cloud point. As the fuel cools, the square-like wax structures get larger and eventually plug the filter not allowing fuel to pass through.



With Cold Flow Additive:

Diesel fuel with cold flow improver changes wax structure to a more pin-like structure. This change allows fuel to pass through the filter as the pin-like structures collect on the filter and the pin-like structures pass through the filter more readily than square-like wax structures. This is what extends the operability of the fuel.

TANK MAINTENANCE

Proper tank maintenance helps ensure your fuel supply stays clean and free of harmful contaminants in your storage tank — and remains that way until it reaches your fuel system. Removing water, sediment and other impurities from the storage tank prevents them from entering your fuel system where they can lead to corrosion, filter plugging, and ice formation that severely hampers engine performance.

Water

Water gets into diesel fuel storage and vehicle tanks in several ways — by condensation of humid air, during transportation, by leakage through faulty fill pipes or vents and by careless handling. During fuel withdrawals, tanks can breathe in large volumes of humid air.

Water in the fuel can cause injector nozzle and pump corrosion, biological growth and fuel filter plugging with materials resulting from the corrosion or biological growth. In cold northern winters, ice formation in fuels containing water creates severe fuel line and filter plugging problems.

Helpful Hint:

Clean and drain water from storage tanks and equipment if you haven't already completed your fall tank maintenance.

Oxidative Degradation

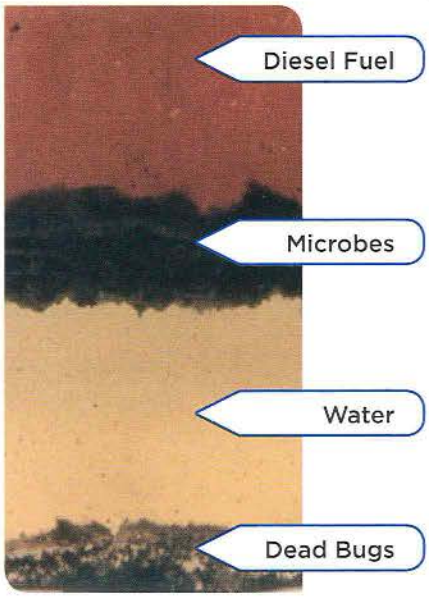
Biological Growth

Particulates

TANK MAINTENANCE

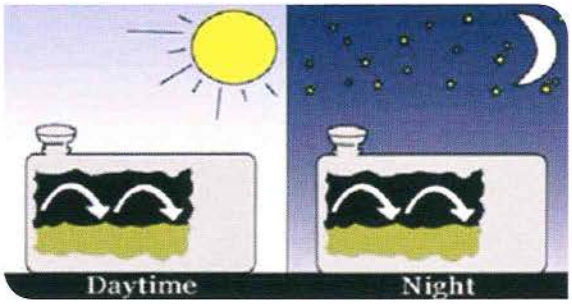
Managing the impact of water in your storage tanks is the foundation of proper tank maintenance. A significant amount of water in the tank will likely cause problems including oxidative degradation (rust, scale), particulates and microbiological growth. Follow these guidelines:

- Tilt tanks to direct water and debris away from the outlet.
- Pressurize tanks to keep vapor and air inside (contact CHS Petroleum Equipment for more information – call 800-852-8186, ext. 7729, option 4).
- Drain and remove all contaminates every 3 months (or as often as needed).
- Install proper filtration systems on bulk tanks (contact CHS Petroleum Equipment for more information – call 800-852-8186, ext. 7729, option 4).
- Filters: All engine manufacturers equip their engines with fuel filters to protect the fuel system. You should replace these filters according to the manufacturer's recommendations. Some manufacturers also provide filters with drain valves and recommend periodic draining of any water that may accumulate from condensation and careless handling in storage or vehicle tanks.
- Clean pump screens regularly.
- Sample fuel for quality assurance purposes quarterly.
- Clean tanks annually.



Phase separation can happen when water is introduced to fuel. The biological growth live in the water and feed on the hydrocarbons (diesel fuel). The water and biological growth will eventually plug filters.

Tank Maintenance Diagram:



Pre-Vent Fill Cap

FUEL SAMPLE STARTER KIT

Application:

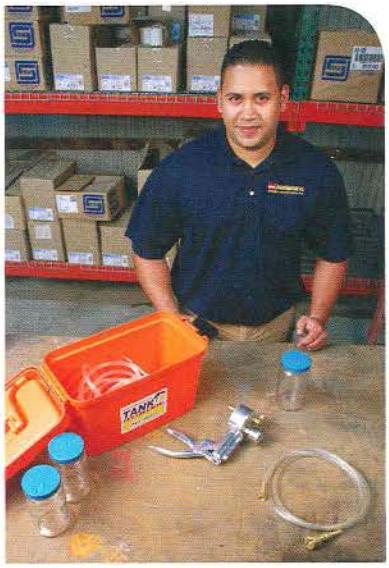
- Portable hand-operated vacuum suction pump device is designed to determine fuel conditions present in fuel storage tanks.
- For use on underground and above-ground tanks for gasoline, diesel fuels, alcohol-blended fuels, as well as fuel oil tanks.
- Oil reservoirs and drums may also be tested.

Design Features:

- 6' x 14' polyurethane suction hoses with brass weights.
- Equipped with three shatter-proof sample containers.

Benefits:

- Collects more accurate samples than water finding paste.
- Case is portable, easy to store and impervious to decomposition caused by fuels.
- Kit is trouble-free and will work on any size tank.
- Metal container holder will keep samples from spilling.



Replacement Parts:

#90030 - Carrying Case

#90218 - Shatter-proof Jar

#90220 - Jar Lid

Contact Information:

CHS Petroleum Equipment
Toll Free Phone:
800-852-8186
ext. 7729, option 4

Toll Free Fax:
888-644-6384

FUEL SAMPLE KIT – DIRECTIONS FOR USE

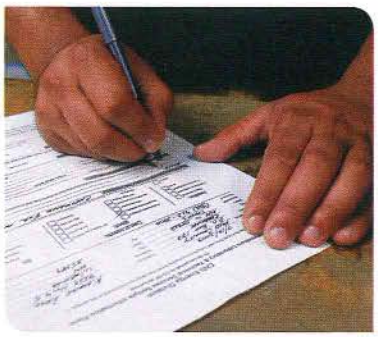
1. Attach brass weight to one end of the hose.

2. Attach the other end of the hose to the lid.

3. Attach jar to the lid.

4. Be sure to collect the sample from the bottom of the tank.

5. Pump sample into jar.



6. Send sample to IGH lab (order sample kits from Lubes Customer Service). Be sure to fill out all paper work including the IGH lab information form.

Note: The jar and hose must be cleaned with water or fuel and dried thoroughly between each sample.

TROUBLESHOOTING

Checklist of Questions

When an issue arises, the following information can help identify the source of the problem.

1. What was the **fuel** temperature at the time of the problem?

2. What terminal did the fuel come from?
   - Was all fuel in the tank sourced from the same terminal?
   - Was all fuel in the tank purchased from the same supplier (i.e. CHS)?

3. What type of fuel is it — Cenex® Ruby Fieldmaster®, Cenex Roadmaster XL®, Cenex Wintermaster®, Cenex® #2 or another supplier's fuel?

4. Is it a blend of #2 and #1? What percentage of #1 did you use?
   - Every 10% of #1 should reduce the cloud point of the fuel around 3 degrees.

5. Was remaining fuel properly blended down, prior to bringing in winter fuel?
   - Customers need to account for the fuel that is already in the tank (bottoms included) when figuring out how to properly blend down tanks. If there is 1,000 gallons of #2 in the tank (including tank bottoms) then 1,000 gallons of #1 would need to be blended to create a 50-50 blend in tank.

6. Was the fuel blended with biodiesel? If so, what percentage?
   - Blends higher than B5 will increase the cloud point of the fuel.
   - Splash blended or terminal blended?

7. Has the customer splash blended a cold weather additive or biodiesel?
   - Splash blending additives or biodiesel when **fuel** is at or below cloud point is not advised. Additive will likely not blend and fall out of solution leading to potential filter plugging problems.

8. Is the storage tank above or underground?

9. Was a bottom sample taken from the vehicle and storage tank?
   - Test kits can be ordered by calling 800-852-8186; select 8441 or 8419.
   - If filter plugging is the problem, the fuel sample must be taken before the filter.
   - Was the filter sent in?
   - Bottom samples are needed to determine if there are any contaminates in the tank.

10. When was the last time a bottom sample was taken from the tank to check for contaminates?

11. When was the last time the tank was cleaned?

12. What type of vehicle was involved? Make, model, type of filters used (paper, glass, etc.) and porosity (2, 3 or 10 micron).

13. Are OEM-recommended filters being used?

CENEX® BRANDED DISTRIBUTOR RESOURCES

Tank Cleaning Services

Optic Fuel Clean, Inc.
866-936-7842
www.cleanfuelguys.com

Tank Filters and New Tank Programs

CHS Petroleum Equipment
800-852-8186, ext. 7729

Biodiesel Information

National Biodiesel Board
www.biodiesel.org

Cenex Fuel Related Questions

Main Number for Fuels Questions
800-547-3835, ext. 1

Product Specification Sheets, Material Safety Data Sheets
www.cenex.com

CHS Technical Services
800-852-8186 – Option #3, Option #2

THANK YOU FOR YOUR DIESEL FUEL BUSINESS, AND WE LOOK FORWARD TO MEETING YOUR WINTER FUEL NEEDS DURING THE UPCOMING SEASON!

CENEX®

A BRAND OF CHS

Item #270002