2023 Cenex® Winter Fuels Products & Best Practices for Handling

FUELED BY INNOVATION. POWERED TO PERFORM.™

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CENEX® BRANDED DISTRIBUTOR RESOURCES

TANK FILTERS AND NEW TANK PROGRAMS

CHS Energy Equipment
800-852-8186

BIODIESEL INFORMATION

National Biodiesel Board
biodiesel.org

CENEX FUEL QUESTIONS

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

Product Specification Sheets and Material Safety Data Sheets
cenex.com

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

BEST PRACTICES

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 travel 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**.
- 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 ❄ Winter Aid IV

ST	CITY	CENEX WINTERMASTER®	CENEX RMXL® SE / CENEX RFM SE®*	#1 DIESEL with CPDA**	CENEX RMXL / CENEX RFM with WA IV† OR CFI‡	ULSD #2 with WA IV† or CFI‡
CO	Denver (Aurora)		✓	✓	✓	✓
IA	Bettendorf (Noble)				✓	✓
IA	Bettendorf (Riverdale)				✓	✓
IA	Council Bluffs (Nustar)			✓	✓	✓
IA	Des Moines		✓	✓	❄	✓
IA	Dubuque (MGL)			✓	✓	✓
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	Kansas City		✓	✓	✓	✓
KS	McPherson (CHS)			✓	❄	
KS	Scott City		✓	✓	✓	✓
KS	Topeka				✓	✓
KS	Wichita (Valley Center)				✓	✓
MN	Alexandria	✓	✓	✓	✓	✓
MN	Mankato	✓	✓	✓	✓	✓
MN	Marshall	✓	✓	✓	✓	✓
MN	Minneapolis	✓	✓	✓	✓	✓
MN	Rochester		✓	✓	✓	✓
MN	Wrenshall			✓	✓	✓
MO	Carrollton (Sinclair)			✓		
MO	Columbia		✓	✓	✓	✓
MO	Palmyra				✓	✓

Kerosene Terminals – Kerosene is available in St. Paul Park, Minn., and Coffeyville, Kan. Availability subject to physical outages, terminal maintenance, etc.
*Seasonally Enhanced **Cenex Premium Diesel Additive †Winter Aid IV ‡Cold Flow Improver

✓ Available ❄ Winter Aid IV

ST	CITY	CENEX WINTERMASTER®	CENEX RMXL® SE / CENEX RFM SE®*	#1 DIESEL with CPDA**	CENEX RMXL / CENEX RFM with WA IV† OR CFI‡	ULSD #2 with WA IV† or CFI‡
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				✓	✓
WA	Hillyard (Spokane)				✓	✓
WI	Chippewa Falls	✓	✓	✓	❄	❄
WI	Green Bay (US Oil)			✓	❄	
WI	Junction City (FHR)	✓	✓	✓	❄	
WI	McFarland	✓	✓	✓	❄	❄
WI	Milwaukee (US Oil)				✓	✓
WI	Waupun (FHR)	✓	✓	✓	❄	
WY	Cheyenne		✓		✓	✓

Kerosene Terminals – Kerosene is available in St. Paul Park, Minn., and Coffeyville, Kan. 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® Premium Diesel is formulated with an operability of -30°F and a typical cold filter plugging point (CFPP) of -37°F. Cenex Wintermaster is specifically formulated for the demands of diesel powered equipment in the most extreme winter conditions.

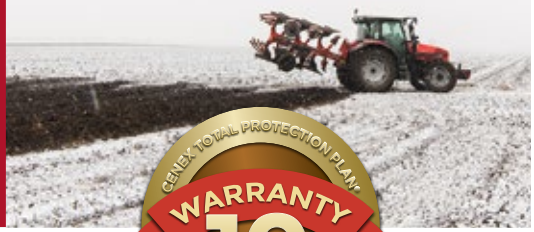
Cenex Roadmaster XL® and Ruby Fieldmaster® Seasonally Enhanced Premium Diesel fuels are formulated for moderate climates and provide outstanding shoulder season flexibility. Cenex Seasonally Enhanced Premium Diesel Fuels deliver a cold filter plugging point (CFPP) of -25°F.

#1 Diesel with Cenex Premium Diesel Additive* is used to blend down your Cenex Premium Diesel 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.

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 TOTAL PROTECTION PLAN®

Like all Cenex Premium Diesel fuels, our winter lineup meets the requirements for **Cenex Total Protection Plan® (TPP)** coverage in agricultural equipment.



* Where Cenex Ruby Fieldmaster is available, TPP Warranty holders are required to utilize this product when blending with Cenex Ruby Fieldmaster for seasonal purposes. The use of an untreated #1 distillate with Cenex Ruby Fieldmaster may void your TPP warranty.

CENEX® WINTERIZED PREMIUM DIESEL FUELS COMPARISON CHART

	CENEX WINTERMASTER®	CENEX ROADMASTER XL® SE* RUBY FIELDMASTER® SE†	#1 DIESEL with CPDA‡
ATTRIBUTES / BENEFITS			
Typical CFPP	-37°	-25°	-60°
Operability °F	-30°	**	-50° §
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	45-47	45-47	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			
Injection Stabilizer	✓	✓	✓
Lubricity Improver	✓	✓	✓
Demulsifiers	✓	✓	✓
Storage Stabilizers	✓	✓	✓
Corrosion Inhibitors	✓	✓	✓
Detergents	✓	✓	✓
Cetane Improver	✓	✓	✓
Wax Anti-Settling Agents (WASA)	✓	✓	✓

* **Cenex RMXL SE** – Cenex Roadmaster XL Seasonally Enhanced Premium Diesel Fuel

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

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

§ Estimated temperature based on fuel origination

** Contact your authorized Cenex Premium Diesel Distributor

CENEX® PREMIUM DIESEL FORMULATION ENHANCEMENTS

Cenex® Premium Diesel Fuels are precisely formulated with a terminally injected additive package that provides customers in demanding industries the power, fuel efficiency and reliable engine performance they need to get the job done on the road and in the field. Cenex has been diligently working on enhancements to our additive formulation that will deliver superior performance beyond any previous formula.

DIFFERENTIATORS	ENHANCEMENTS	VALUE-ADDED BENEFITS
Keep engines running cleaner, longer with our **aggressive detergency package** that provides optimal engine performance and efficient combustion.	Our aggressive detergency package cleans the engine, preventing and breaking down deposit buildup, improving fuel efficiency and increasing its overall power. The increased detergency boosts the efficacy of the other additives.	⊕ **40% more effective** in breaking down engine deposits ⊕ **2.5x more effective** in cleaning up injector deposits and preventing deposit buildup in dirty equipment ⊕ **Up to 4.5%** more power when it matters most ⊕ **Up to 5%** better fuel economy when every dollar counts
Improve engine performance with a **total water management system** for longer equipment life.	Our state-of-the-art total water management system safeguards combustion systems, separating water from fuel efficiently, so it settles quickly at the bottom of the storage tank for easy drainage. Any remaining negligible water is entrained for safe passage through the combustion chamber.	⊕ Protects filters and injectors ⊕ Safeguards combustion system ⊕ Prevents water-caused corrosion ⊕ Keeps contaminants out of storage tanks
Improve power and fuel efficiency with a **more complete burn.**	Our enhanced formula is 25% more effective in reducing exhaust cylinder temperature deviations for improved fuel efficiency and increased equipment power.	⊕ Ensures efficient combustion ⊕ Reduces soot production ⊕ Decreases wear and tear on exhaust system ⊕ Fewer regenerations
Protect equipment from contaminants with **maximum filterability and better biostability.**	Our improved formula extends the life of diesel particulate filters, protects fuel injectors and pumps, and keeps exhaust aftertreatment systems clear.	⊕ Reduces filter blocking by **up to 75%** ⊕ Reduces fuel degradation with **20% better biostability** ⊕ Extends storage life **3-6 months longer**

CENEX® PREMIUM DIESEL FEATURES AND BENEFITS CHART

With Cenex® Premium Diesel Fuels, your customers are assured maximum protection from harmful engine deposit buildup. Our cleaner-burning diesel fuels, aggressive detergent agents and total water management system help fuel systems stay clean and perform at their optimal level, reducing the total cost of ownership over the lifespan of equipment.

FEATURE	BENEFIT
Injection and Combustion Optimization	**Addresses fuel oxidation problems in the newest engine technology** ✓ Prevents diesel fuel from coking ✓ Reduces filter and injector repairs and replacements ✓ Prevents internal diesel injector deposits from forming deep inside high-precision injectors
Storage Stability	**Extends storage life 3-6 months longer than typical #2 diesel** ✓ Tolerates temperature extremes ✓ Reduces gum and varnish buildup ✓ Increases injector life and optimizes combustibility
Corrosion Protection	**Protects fuel lines from rust and corrosion** ✓ Prevents rust and corrosion from forming on metal parts ✓ Protects fuel systems from rust and pitting ✓ Prevents corrosion-caused leaks, blocking and breaks ✓ Slows natural diesel fuel degradation caused by exposure to oxygen
Improved Lubricity	**Protects moving parts from excessive wear and failure** ✓ Provides 10% to 15% more lubricity ✓ Protects injector and fuel pumps against wear ✓ Meets OEM fuel lubricity recommendations
High Cetane Number	**Enhances ignition quality for quicker, smoother starts** ✓ Generates fewer emissions for longer-lasting diesel particulate filters ✓ Lowers regenerations ✓ Reduces wear and tear on vehicle starter and battery ✓ Improves cold-weather starts

WINTER FUELS BASICS

TERMS

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.

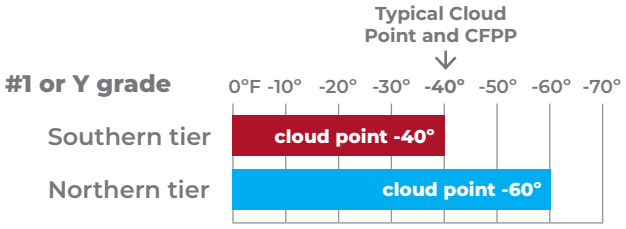
Operability means equipment is still functioning and filters are not plugged.

Wax Anti-Settling Agents (WASA) reduce settling of wax crystals in vehicle tanks and aboveground storage tanks which are known to clog filters and other fuel system components.

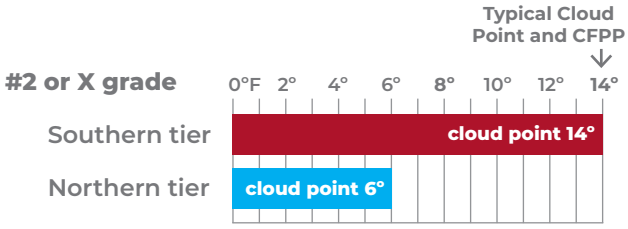
Cold Filter Plugging Point (CFPP) is the temperature when fuel will plug filters.

CLOUD POINT AND CFPP OF COMMON FUELS

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



#2 or X grade fuel meets the pipeline terminal specification for cloud point, typically around 14°F.



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

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

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.

APPEARANCE IS KEY:
You can tell if fuel has reached its cloud point if the fuel looks cloudy.

Fuel at cloud point

Fuel at cold filter plugging point

Fuel without a cold flow improver (CFI) and wax anti-settling agent (WASA)

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.

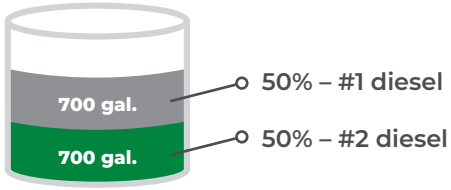
When blending down a tank, pay close attention to the amount of fuel in the tank — this is known as the "heel." It is also important to know your proper treat rate and be sure to calculate it accurately. Treat rates vary by region or climate; for more information, contact your Cenex® Representative.

EXAMPLE 1

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

Q: How much would you bring into the tank to create a 50-50 blend?

A: 700 gallons of #1 diesel.



50-50 blend

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.

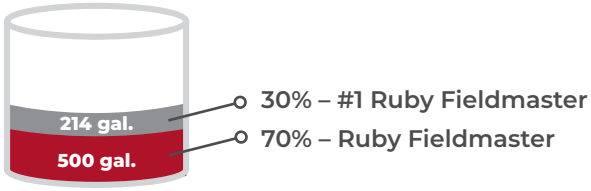
EXAMPLE 2

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 a 30-70 blend?

A: 214 gallons of #1 Ruby Fieldmaster.



30-70 blend

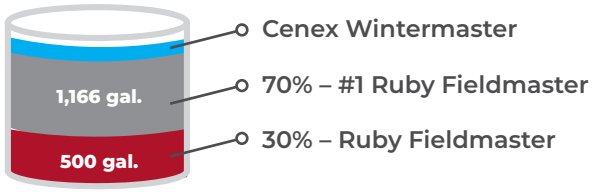
EXAMPLE 3

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 a 70-30 blend?

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



70-30 blend

PROPER BLENDING

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 the 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

RULE OF THUMB:
Adding 10% #1 will typically reduce the cloud point of #2 fuel by 3 degrees.

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.

Q: Is this a good idea?

A: 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 in 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°F-5°F) cloud point and CFPP characteristics to conventional diesel products and can be treated in a similar fashion 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.
- Biodiesel may also have a negative impact on CFI response in blended fuel.

AST (ABOVEGROUND 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°F-45°F, will keep fuel above its cloud point.

COLD FLOW IMPROVERS

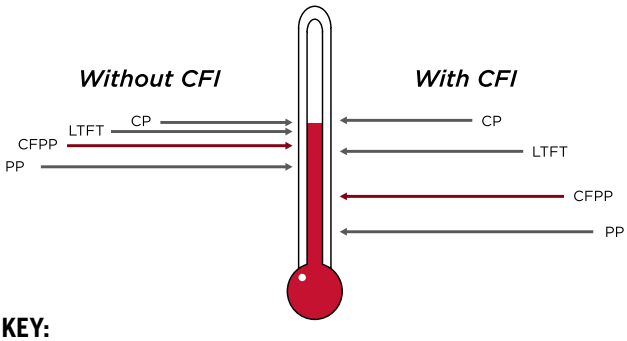
Cold flow improvers are designed to extend the operability of fuel by:

- Altering 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 degrees below the fuel's cloud point (15 degrees delta).

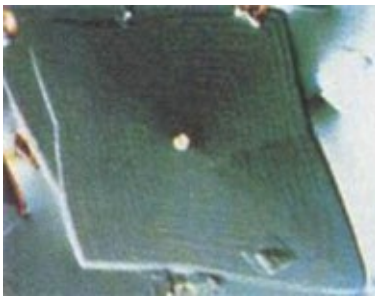
Using a cold flow improver (CFI) allows for operations at lower temperatures than that of unadditized/untreated fuel.



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

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.



DISPERSING WAX (WASA – WAX ANTI-SETTLING AGENTS)

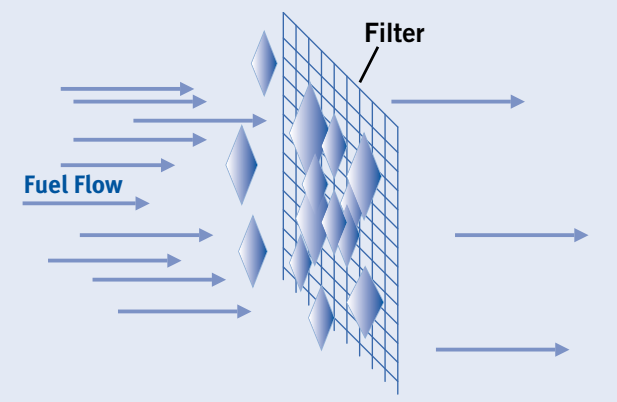
Wax dispersants extend the operability by keeping wax crystals dispersed for long periods of time when fuels are stored below the fuel's cloud point.

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).

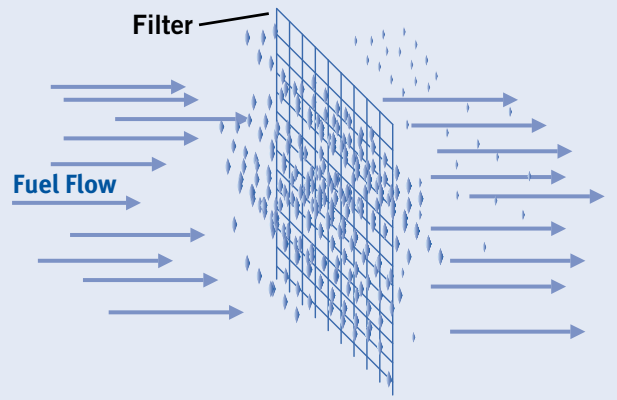
COLD FLOW IMPROVERS:
Additives that change the structure of the wax crystal, not the amount of wax. This allows the diesel fuel to operate at lower temperatures.

COLD FLOW IMPROVERS – EXTENDING OPERABILITY
WAX DISPOSITION ON FILTERS

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 pass through the filter more readily than square-like wax structures. This is what extends the operability of the fuel.



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

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

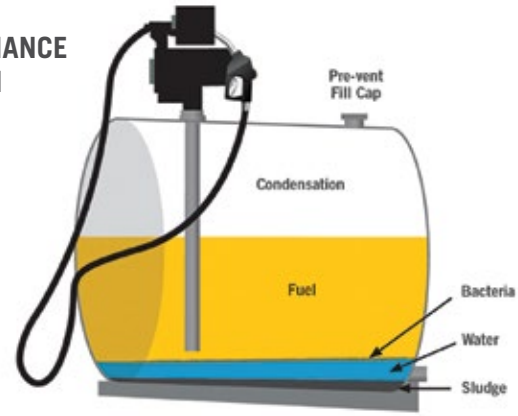
Particulates

Biological Growth

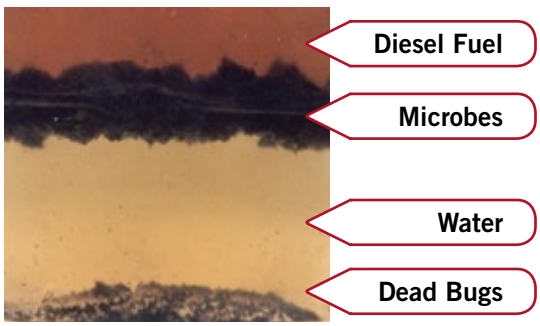
Managing the impact of water in your storage tanks is the foundation of proper tank maintenance. A significant amount of water in the tank will likely cause problems including oxidative degradation (rust, scale), particulates and microbiological growth. Follow these guidelines:

- Tilt tanks to direct water and debris away from outlet.
- Pressurize tanks to keep vapor and air inside.
- Drain and remove all contaminates every three months (or as often as needed).
- Install proper filtration systems on bulk tanks (contact CHS Energy Equipment at 800-852-8186).
- **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 and tanks annually.
- Sample fuel for quality assurance purposes quarterly.

MAINTENANCE DIAGRAM



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.



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 aboveground 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 Energy Equipment
Phone: 800-852-8186
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 Laurel lab (order sample kits from Lubes Customer Service). Be sure to fill out all paperwork including the Laurel lab information form.

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

TROUBLESHOOTING

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

What was the fuel temperature at the time of the problem?

_____

What terminal did the fuel come from?

_____

Was all fuel in the tank sourced from the same terminal? ☐ Yes ☐ No

Was all fuel in the tank purchased from the same supplier (i.e. CHS)? ☐ Yes ☐ No

What type of fuel is it?

- ☐ Cenex® Ruby Fieldmaster®
- ☐ Cenex Roadmaster XL®
- ☐ Cenex Wintermaster®
- ☐ Cenex® #2
- ☐ Another supplier's fuel _____

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.

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 the tank.

Was the fuel blended with biodiesel?
If so, what percentage? _____

Blends higher than B5 will increase the cloud point of the fuel.

- ☐ Splash blended
- ☐ Terminal blended

Has the customer splash blended a cold-weather additive or biodiesel?

- ☐ Cold-weather additive
- ☐ 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.

Is the storage tank:

- ☐ Aboveground
- ☐ Underground

Was a bottom sample taken from the vehicle and storage tank? ☐ Yes ☐ No

Test kits can be ordered by calling 800-852-8186.

If filter plugging is the problem, the fuel sample must be taken before it reaches the filter.

Was the filter sent in? ☐ Yes ☐ No

Bottom samples are needed to determine if there are any contaminates in the tank.

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

_____

When was the last time the tank was cleaned?

_____

What type of vehicle was involved?

Make _____

Model _____

Type of filters used *(paper, glass, etc.)* _____

Filter porosity *(2, 3 or 10 micron)* _____

Are OEM-recommended filters being used? ☐ Yes ☐ No

Thank you for your diesel fuel business.
We look forward to meeting your winter fuel needs during the upcoming season.