



The Cold, Hard Facts on Diesel Fuel Gelling

Diesel fuel gelling is a common problem that often impacts engine performance and results in downtime. Although it can occur year-round, it is most prevalent in winter, with the effects of cold temperatures on #2 diesel. Diesel fuel gelling causes several performance-related issues, including significant engine power loss, and difficulty starting or keeping the engine running. Sometimes blamed on the fuel filter, diesel fuel gelling plugs the filter, preventing fuel from flowing properly. This restricted flow may keep the engine from starting. Even if it does start, it might not stay running for long.

The Cause of Fuel Gelling

Gelling problems are typically caused by the effects of temperature on paraffin, a component of diesel fuel. Paraffin waxes are combustible, adding power when burned in the engine. However, when temperatures drop, diesel will start to solidify. The phases of fuel gelling include cloud point, pour point and cold-filter plug point.

Cloud Point

Cloud point is the temperature at which paraffin begins to form cloudy wax crystals. When the fuel temperature reaches cloud point, the wax crystals begin to form. Typically, cloud point temperatures range from -18°F to 20°F (-28°C to -7°C). Depending on fuel quality, they can be as high as 40°F (4.4°C).



Cold-Filter Plug Point

The point where the filter plugs and operations cease is the cold-filter plug point (CFPP). CFPP and cloud point depend on fuel grade, fuel quality and temperature.

Due to viscosity, concerns are amplified by biofuel content. Produced using different oils, such as soybean, corn and animal fat, biofuels have an even higher gelling temperature, increasing the chance of filter clogging.



Fuel Gelling Prevention and Solutions

Many states mandate when fuel stations switch to winterized diesel blends. However, the gel point of winterized blends varies widely. Using #1 diesel or a winterized diesel blend isn't foolproof. There's high risk for encountering poor quality or unconditioned fuel. In extremely cold climates, many operators choose more reliable solutions to protect their vehicle or equipment.

For fuel to flow properly, the fuel temperature must be above the pour point. When fuel has gelled, pushing the vehicle or equipment into a garage for several hours may temporarily fix the gelling issue. Indoors, it takes eight to 10 hours or a full day to resolve a gelling problem. If temperatures remain cold or an interior space is unavailable, this is an inadequate solution, resulting in downtime.

Diesel Fuel Warmers

A more reliable choice, diesel fuel warmers are a dependable, low-maintenance solution that heats diesel fuel to safe operational temperatures. Fuel heating options include electric and engine coolant-based fuel warming. Multiple warmers can be used in conjunction in extremely cold climatic conditions. Phillips & Temro offers a range of in-tank and in-line fuel warming products. The right solution for a specific vehicle or stationary equipment depends on the fuel issues and the equipment operation.



Diesel Fuel Warmers

- Improve efficiency by providing trouble-free operation in cold-weather environments
- Reduce equipment downtime
- Improve engine operating efficiency by reducing fuel viscosity
- Reduce or eliminate fuel additive use
- Are available for original equipment manufacturer (OEM) and aftermarket installation

In-Tank Fuel Warming

- Delivers heat to the fuel in the tank and fuel drawn out of the tank
- Prevents fuel gelling in the tank when the engine operates for long periods under moderate to full engine load
- Improves fuel flow through hose and filter
- Stabilizes fuel temperature above the pour point



In-Line Fuel Warming

- Prevents gelling in the primary fuel filter
- Heats the fuel closer to the primary fuel filter
- Connects to the fuel line
- Does not require fuel tank modifications



Electric In-Line Heater – Hotline

- Provides warm fuel for engine start-up
- Operates on 12- or 24-volt power
- Requires no tank modification
- Replaces a section of fuel line
- Can be used in conjunction with other fuel warming devices



To learn which fuel warming product is right for your application, contact Phillips & Temro at 1-800-328-6108 or visit phillipsandtemro.com/solutions/fuel-fluid-heating