

Diesel Gelling

This article has been compiled in the interest of Diesel consumers in South Africa by the South African Petroleum Industry Association (SAPIA) and the National Association of Automobile Manufacturers of South Africa (Naamsa).



What happens when diesel fuel gels?

Diesel fuel is a very complex mixture of hydrocarbons. As it cools down in cold weather, it does not “freeze” at a single temperature like water. Instead it turns cloudy as minute wax crystals begin to form in the fuel and eventually thickens like soft jelly.

If cooled further, it becomes difficult to pump through the fuel system in your vehicle and in extremely low temperatures it could finally solidify. It is therefore important to be mindful of the lowest ambient temperatures in your area and what precautions must be taken to avoid problems associated with excessive diesel gelling.

Potential problems in winter

Diesel consumers in the colder areas of South Africa, where the ambient temperature frequently drops to below -7°C for several hours, are often confronted with vehicles that do not want to start or perform satisfactorily when a sudden cold spell occurs during the winter months. What are these problems, their causes and what can be done to alleviate them?

Identifying the colder areas and adding additional additive to the diesel fuel distributed in such magisterial districts

The difference between winter and summer grade diesel fuels

Summer and winter grade diesel fuels differ in their low temperature gel formation characteristics. Winter grade diesel normally contains a specialised additive to enable the diesel to be used at lower ambient temperatures without gelling problems.

The Cold Filter Plugging Point (CFPP) is the lowest temperature at which the fuel is liquid enough to pass through a test filter under standard conditions. The SANS (South African National Standards) specifications require summer grade Diesel to have a (CFPP) of maximum $+3^{\circ}\text{C}$ and for the winter grade Diesel fuel a CFPP of maximum -4°C .

As certain geographic areas in South Africa are colder than others, the oil industry has taken further steps to reduce the risk of gelling problems occurring, by identifying the colder areas and adding additional additive to the diesel fuel distributed in such magisterial districts. This additional additive dosing will lower the CPFF to approximately -7°C .

For South Africa, the winter grade diesel fuel is distributed from 1 April to 30 September.

Preparation for winter

Simple precautions can be taken by the consumer before the onset of the cold weather in order to reduce the risk of problems being experienced with diesel fuel during winter months.

Preventative measures

Storage

Large volume storage tanks should either be installed underground or erected in a sheltered position. Do not buy large quantities of summer diesel and store it for use in winter periods.

Mixing of winter and summer grade diesel

Ensure that summer grade Diesel fuel is run down to a minimum stock level in good time before ordering winter grade Diesel fuel. If several tanks are used for storage of Diesel fuel, use them in rotation rather than keeping one as a reserve.

Vehicles

Remember that gelling is a temperature related phenomena.

- ⇒ Ensure that vehicles are parked in a sheltered position overnight.
- ⇒ Keep the fuel tank full as large volumes are less susceptible to ambient temperature fluctuations and hence gelling.
- ⇒ Avoid re-fueling diesel vehicles in “warm” areas and then overnighting or passing through colder regions. Rather refuel in the “cold” region.
- ⇒ Under extreme conditions, the vehicle may not start at all. Delay departure until later in the morning.
- ⇒ In some instances the vehicle will start but not perform satisfactorily. Allow the vehicle to idle and build up heat in the fuel tank through circulation of hot fuel from the engine back to the fuel tank.

Also remember not to use open flames to heat fuel systems.

Should you experience cold start problems, please report this to the respective oil company where you refuelled or purchased your diesel fuel or contact your vehicle dealership.

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