



Understanding CFPP

The cold filter plugging point (CFPP) is now often used instead of cloud point (CP) as the criterion to predict the low temperature performance of BP Diesel. The CFPP is the lowest temperature at which fuel will still flow through a specific filter. Although widely used overseas, it is not well known or understood in Australia. This Fuel News aims to provide that knowledge and understanding.

WAX

All diesel fuels contain wax. Normally the wax is a liquid in solution in the fuel. It is an important component because it gives the fuel a good cetane value. However, when a fuel gets cold the wax will crystallise, and the crystals can block engine fuel filters. If the temperature is sufficiently low to crystallise a lot of wax the engine will stop through fuel starvation.

Because removing the wax during refining reduces cetane the amount of wax in diesel is limited by the season. Fuel specifications are set at levels that ensure most users will be free of wax problems most of the time. The Australian Standard for Automotive Diesel Fuel (ADF) was prepared on this basis. Occasionally users will have problems in unseasonally cold weather, but it is impractical to give complete protection.

CLOUD POINT

When fuel is cooled, the temperature at which wax is first seen to crystallise is known as the cloud point. Wax cannot block fuel filters at temperatures above the fuel cloud point, because no solid wax is present. In other words, the cloud point is a "fail safe" control. This is why cloud point has been the traditional criterion for setting low temperature fuel controls.

WAX MODIFIERS

Wax crystal growth can be modified by a fuel additive. By retarding crystal growth, filters will not block so readily, so the same fuel can operate satisfactorily at lower temperatures.

The additive does not change the fuel's cloud point. Instead the wax crystals still appear at the same temperature, but as a larger number of minute crystals. A test that predicts the real low temperature operability limit was then required. This is the cold filter plugging point test. It measures the lowest temperature at which fuel will still flow through a specific filter.

CFPP/CP DIFFERENCE

Without a wax modifier, a fuel's CFPP is generally around 3°C below the CP. That is why the Australian Standard for ADF specifies a 3°C difference.

With a wax modifier, the difference will be greater, but to ensure there is not an excess of fine wax crystals which may be sufficient to block filters, BP specifications require that the difference be no greater than 8°C.

BP DIESEL

Because the effectiveness of wax modifying additives is dependent on the crude oil being processed, refineries only use it when blending product from suitable crude oil. Not all BP Diesel contains a wax modifier; and its presence is not apparent from fuel appearance. Whether or not a fuel contains a wax modifier, the CFPP gives a good prediction of the lowest temperature at which a fuel should be used while allowing refineries to use of the latest additive technology.

**For further information, please call the BP Lubricants and Fuel
Technical Helpline 1300 139 700 local call
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