

What is 35 Second Oil?

Our expert Martin Arden explains all.

In this blog article, our Midlands Area Sales Manager Martin Arden explains in detail 'what is 35 second oil' and how this type of oil is used within heating systems.

What is 35 second oil?

Also known as 'Gas Oil', or 'Red Diesel', 35 Second oil is used for commercial boiler, generator, agricultural, and vehicle fuel. 35 second Gas oil suitable for use in heating appliances should meet BS2869: Part 2 : 2010 classifications Class D. The Fractionating column diagram below shows how crude oil is separated into its component parts producing various fuels for use in transport and industry, one of which is Diesel oil, of which 35 second is a type.

What does 35 second oil look like?

35 Second diesel oil has a clear and bright, cherry red appearance, without sediment and has a lower cost than car diesel fuel, as it has low or rebated tax relief, making it illegal to be used on the road. The red appearance enables it to be differentiated from diesel used in cars, heavy penalties are applied if caught using 35 Second on road-going vehicles.

The 'Sec' denotes a measure of a hydrocarbon fuel viscosity and is expressed as the number of seconds 50ml of fuel takes to flow under controlled conditions, through a set size orifice. This testing equipment is known as the Redwood Viscometer.

The fuel in the holding cup is heated to 40 degrees C, and once conditions are correct, time is started and the oil allowed to pass through the orifice, once through, the time is stopped, and the number of seconds recorded.

The longer the time taken, the thicker the oil and the higher the viscosity. Gas oil is one of the thicker oil types used in heating appliances which can vary from 28 Sec to 35 Sec.

Low temperature and best storage practice

When being stored or fired viscosity is affected by the ambient temperature, due to its thicker nature 35 Sec oil is susceptible to clouding in cold ambient conditions and can gel or wax a few degrees below the cloud point temperature. Although the cloud point temperature can vary due to local conditions any temperature below zero may result in clouding. This will, of course, reduce the flow of oil and render the heating appliance redundant, as a way of reducing this some burners have a preheater to ensure constant flow. Another option is to insulate any above-ground supply pipework.

Below diagram shows a typical oil storage installation.

Typical Arrangement of Bottom Outlet

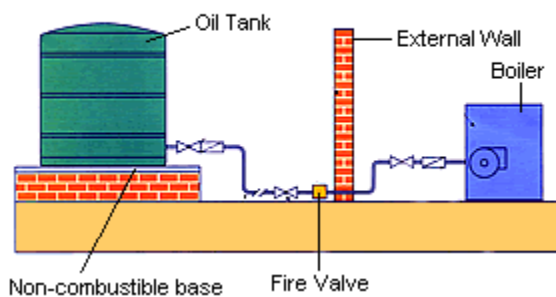


Image by <http://www.telfordtanks.co.uk/installations.asp>

In the UK, often the perceived issue of waxing is incorrect, and can often be attributed to condensation or moisture having formed in the storage tank, this can easily freeze causing the effect of waxing.

Oil Combustion

35 Sec Class D oil burns hotter than other oils and has a nett calorific value of 10.85 kwh per litre or 36.28mj per litre, but has a relatively high sulphur content in comparison to other fuels up to a maximum of 1000ppm. Lower sulphur content versions of 35 Sec oil are available, the A2 version is used for agricultural vehicles and has a 10ppm sulphur content but is not recommended for a boiler/burner applications. Other variants are also available but care should be taken as burner manufacturers will not always uphold warranty claims. The liquid oil in itself does not burn, it is the vapour it creates which is combustible. This is achieved by pressurizing the fuel through a pump and a high-pressure jet nozzle, which in turn vaporizes or mists the oil causing it to ignite when mixed with the correct amount of air and a spark.

The schematic diagram below shows typical components and the combustion process for a pressurized burner.

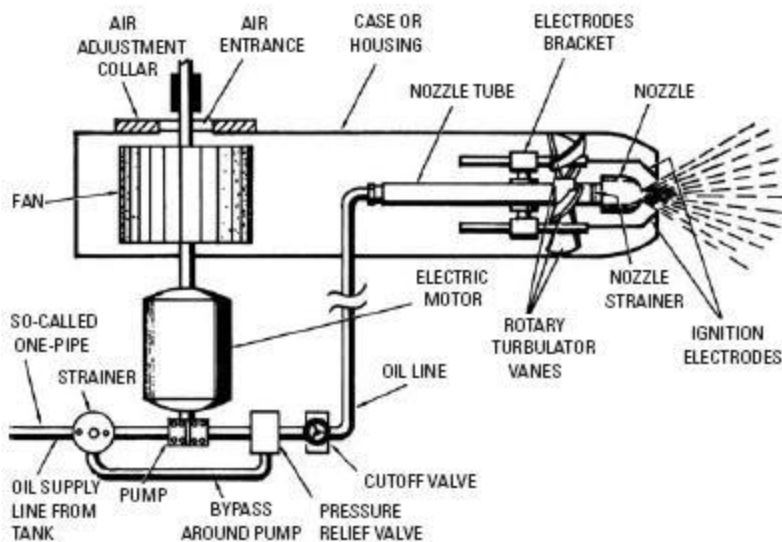


Figure 1-12 Schematic of a gun-type oil burner.

Image by <http://www.telfordtanks.co.uk/installations.asp>

Typical oil pressures are high to enable vapourization, in the region of 200psi, and these burners should only be worked on by suitably qualified engineers. Environmental concerns over airborne pollutants make the future of Class D type 35 Sec oil uncertain, less environmentally harmful options are now available and conversions are taking place. As the cost of Gas oil is now also higher than these

alternatives, new appliances are also being manufactured to suit the cheaper fuels.