

Specifications for EN 590 Diesel and EN 590 Gas Oil

EN 590 is a standard published by the [European Committee for Standardization](#) that describes the physical properties that all automotive [diesel fuel](#) must meet if it is to be sold in the [European Union](#) and several other European countries.

Based on 98/70/EG it allows the blending of up to 7% [fatty acid methyl ester](#) biodiesel with 'conventional' diesel - a 7:93 mix.

All road diesel (DERV) that is now sold in the UK meets the EN 590 standards and has a compulsory 7% by volume biodiesel component blended into it, usually EN 14214 FAME biodiesel. This is optional for EN 590 fuel used as gas oil, as is the cetane content.

EN 590 compliant fuels include red diesel (EN 590 gas oil)and DERV diesel (EN 590 diesel).

Confused by the various fuel specifications? Read an excerpt from Crown Oil: fuel specification guide.

The EN 590 had been introduced along with the [European emission standards](#). With each of its revisions the EN 590 had been adapted to lower the sulphur content of diesel fuel - since 2007 this is called [ultra low sulphur diesel](#) as the former function of sulphur as a lubricant is absent (and needs to be replaced by additives).

emission standard	at latest	sulphur content	cetane number
Euro 1	1 January 1993	max. 0.200%	min. 49
Euro 2	1 January 1996	max. 0.050%	min. 49
Euro 3	1 January 2001	max. 0.035%	min. 51
Euro 4	1 January 2006	max. 0.005%	min. 51
Euro 5	1 January 2009	max. 0.001%	min. 51
Euro 6	1 January 2014		

EN 590 ULSD Road Diesel Specifications

Sample Specs of Crown Ultra Low Sulphur Diesel is road fuel, also called DERV or white diesel, that is suitable for use in all road vehicles powered by a diesel engine. Crown Oil's white diesel is supplied with the below specifications:

Appearance	Clear and bright, free from visible sediment and water.
Colour	2.5 max
Odour	Merchantable
Density @ 15°C g/ml	0.820 min – 0.835 max
Cold filter plugging point	
Winter °C (*)	-15 max
Summer °C (*)	-5 max
Cloud point	
Winter °C (*)	-5 max
Summer °C (*)	+3 max
Flash point (PMCC) °C	56 min
Cetane number	51 min
Cetane index	46 min
Viscosity cst @ 40°C	2.0 min – 4.5 max
Sulphur % Wt	0.001 max
Copper corrosion 3 hr @ 50°C	class I
Micro carbon residue:	–
Residue wt on 10% bottoms	0.30
Ash % Wt	0.01 max
Particulate matter mg/kg	24 max
Water mg/kg	200 max
Distillation °C	
% Vol Rec @ 250°C	65.0 max
% Vol Rec @ 345°C	85.0 min
95% Vol recovered °C	360.0
Oxidation stability mg/100ml	2.5 max

Polycyclic aromatic hydrocarbons (%)	11 max
Lubricity, Corrected water scar	460 Diameter @ °C

EN 590 Gas Oil Specifications: what physical properties does EN 590 diesel have? What are the fuel's chemical properties?

Gas Oil meets BS 2869 (2010) Class A2 and the EN590 specification. Gas oil is a dyed and marked product, to be used for small furnace or boiler applications, stationary diesel and untaxed engines. Crown Oil supplies red diesel that meets EN 590 standards.

For diesel fuel to meet EN 590 specifications, it means that the fuel must have the required physical and chemical properties that the standard requires. The table below shows the physical properties and chemical properties that the EN 590 standard requires, as well as how the fuel meets these characteristics.

Appearance	Clear & bright, Cherry Red, Free from visible sediment.	Pass		
Density at 15°C	kg/m ³	0.820	–	0.860
Kinematic viscosity at 40°C	mm ² /s	1.5	5.5	3.0
Carbon residue(Ramsbottom on 10% residue)	% (m/m)	–	0.30	0.10
Distillation recovery at 250°C	% (v/v)	–	65	42
Distillation recovery at 350C	% (v/v)	85	–	92
Flash point (PMCC)	°C	56	–	>62
Water content	mg/kg	–	200	<100
Particulate content	mg/kg	–	24	<10
Ash content	% (m/m)	–	0.01	<0.001
Sulphur content	% (m/m)	–	0.002	<0.0015
Copper corrosion(3 hrs at 50°C)	Class	–	1	1a
Cold filter plugging point(1) Summer	°C	–	-4	-8
Cold filter plugging point(1) Winter	°C	–	-12	-14
Cetane number	–	45	–	48
Fatty acid methyl ester (FAME)	% (v/v)	–	7.0	<0.1

Carbon	% (m/m)	–	–	87
Hydrogen	% (m/m)	–	–	12.75
Nitrogen	% (m/m)	–	–	0.01 – 0.05
Gross specific energy (MJ/kg)	MJ/kg	–	–	45.4
Gross specific energy (MJ/litre)	MJ/litre	–	–	38.8
Mean specific heat capacity over 0 – 100°C	KJ/kg °C	–	–	2.05
Volume correction factor	per °C	–	–	0.00081
Strong acid number	mg KOH/g	–	nil	nil
Lubricity (HFRR)	µm	–	460	<460
Oxidation stability 0.0 – 7.0% FAME	g/m ³	–	25	–
Oxidation stability 2.0 – 7.0% FAME	h	20	–	–