
Product Technical Specification **Zero® Syn95™**

Performance qualities

Fuel standard	Gasoline to BS EN 228	UK/EU - standard pump fuel (petrol)
Grade	95 RON	95-Octane
Ethanol content	E0 - "E zero"	Ethanol-free; pure gasoline
Compatibility	95 RON	All engines compatible with UK pump fuel
Modification to vehicles / engines / tanks	None	"Drop-in" fuel; no modifications necessary
Power/range (relative to fossil-fuel)	Same	Same as pure 95 RON gasoline
Power/range (relative to E5/E10)	Superior	Superior power / miles-per-gallon due to absence of ethanol
Mixing	Free	Can be freely mixed with 95 RON fossil-fuel gasoline
Contaminants	0% lead	Lead-free
	0% sulphur	Sulphur-free

Environmental qualities

Manufacture	100% synthetic	Manufactured by fully industrialised process
Content	100 fossil-free	Zero fossil-fuel content by molecule and energy
Carbon	100% atmospheric	All atmospheric carbon feedstock (from carbon dioxide)
Hydrogen	100% green	All green hydrogen feedstock (from water)
Energy	100% renewable	All solar, wind or geothermal electricity
Biological material	None	Free of biological feedstocks; no additional demand on agriculture / land use
Waste material	None	Free of waste material feedstocks
Emissions	100% fossil-free	Fully sustainable
Carbon	Carbon-neutral	Same carbon dioxide as fossil fuel exactly balanced by the fuel manufacture
Particulates	Not measured	Subjectively less than conventional fuels
Nitrous oxides (NOX)	Not measured	Subjectively less than conventional fuels
Sulphur	None	Sulphur-free fuel
Lead	None	Lead-free fuel

Frequently asked questions

Zero Petroleum uses an industrial process to create a groundbreaking fuel that is the solution to the planet's continued need for petrochemicals. Below are answers to some of the most frequently asked questions about it.

Overview

What is Zero® fuel? It is a sustainable and fossil-free fuel. It can be petrol (gasoline), diesel or jet fuel. It is exactly the same as a traditional fuel, but manufactured using a carbon-neutral process in a factory rather than being extracted from the earth.

Does it produce carbon emissions? The lifecycle of Zero® fuel is carbon neutral and produces zero net carbon emissions. This is because its production extracts the same amount of carbon dioxide from the atmosphere as is released when it is burned, leaving the atmosphere in exactly the same state as it was before it was manufactured and consumed.

What vehicles can it be used in? It is a direct "drop-in" fuel, which means it can be used by any vehicle that runs on fossil fuel petrol without the need for any modifications whatsoever.

Why do we need synthetic fuels? Fossil fuels have an extremely high energy density, which means they provide a lot of power or range for a small volume and weight of fuel. They are currently used for many different applications, from personal transport to global shipping.

To achieve net zero emissions, all these applications must find alternative energy sources and many applications require greater performance than can be met by existing or other emergent technologies such as battery-electric or hydrogen.

What are the key benefits of Zero® fuels?

Zero® fuels provide the same energy density as fossil fuels and deliver the same performance. As a result, when compared to all other fossil fuel alternatives, it requires the least amount of payload (weight and volume) for the equivalent power output. It also enables existing vehicles to continue to be used without modification, rather than being consigned to scrap.

Where does Zero Petroleum fit into the energy future? There are four main emerging forms of energy to replace fossil fuels in vehicles – electrification, hydrogen, mini-nuclear reactors and synthetic fuels. The needs of everyday personal transport can be met by electrification, which can provide the solution for high power / short range or vice versa; Hydrogen or mini-nuclear reactors are potentially suitable for longer-range applications such as shipping. However, synthetic fuels meet the needs of certain high performance or heavy payload applications – such as heavy construction, farming vehicles, aviation or high performance automobiles – that require greater performance or would benefit from less fuel load to enable greater transportation payload capacity.



Product specifications

What is Zero® fuel made from? Just like traditional fuels, Zero® fuel is a hydrocarbon – a combination of hydrogen and carbon atoms.

How does Zero® Syn95™ compare to standard petrol? Zero® Syn95™ meets the same fuel standard as UK and European pump fuel, which is BS EN 228. It provides the same power and range as 95-octane gasoline – also called Midgrade fuel in the US – and better power and range when compared to the E5 (5% ethanol) and E10 (10% ethanol) fuels used in the UK and across Europe.

How is it made? The manufacturing process involves obtaining hydrogen from water through electrolysis and obtaining carbon using a carbon capture technique that removes carbon dioxide (CO₂) from the atmosphere. These are then combined through a series of chemical processes to form the hydrocarbon petroleum fuel. The magic of the process is captured in our tag-line “600 million years in 3 minutes®”!

Is it a biofuel? No, it is not a biofuel; it is a synthetic fuel. A biofuel is made using biological materials that must be grown in fields or forests and the process is not truly scalable without significant impact on land use and deforestation. Zero® fuels use only water and carbon dioxide as source materials, both of which are abundant in the atmosphere. As an industrial process which we call “a forest in a factory®” the overall chemistry is the same as that of plants, we even produce oxygen as a “waste” product!

Is it made from waste? No, it is not made from waste materials; it is a synthetic fuel. Fuels made from waste are not scalable, as waste is a limited resource (including a lot of fossil fuel materials such as plastics) and therefore not truly sustainable or renewable.

Does it contain ethanol? No, it is pure synthetic gasoline and contains no ethanol.

Does it contain sulphur or lead? No, it is 100% sulphur-free and 100% lead-free. While lead has now been removed from fossil fuels, they still contain sulphur because it is present in the raw material from which it is made, crude oil. In contrast, as Zero® is a pure hydrocarbon produced synthetically, it contains no impurities at all.

Does it contain rare metals such as lithium and cobalt? No. The fuel does not contain any traces of rare metals and no significant quantities of rare metals are used in the manufacturing machinery used for fuel synthesis.

Emissions and sustainability

Is Zero® fuel sustainable? Yes. Zero® fuel is produced using only materials that exist naturally in abundance in the environment. In contrast, fossil fuels are created through the decaying of fossils over millions of years and are extracted from a finite resource.

Is it renewable? Yes. See the answer to 'Is Zero® fuel sustainable' above.

Does it emit the same toxins as fossil fuels? No, it does not emit the same toxins created by fossil petroleum. This is because it is a pure fuel that is manufactured through a synthetic process using pure ingredients (literally just water and carbon dioxide) that do not include any unwanted impurities. In contrast, fossil fuels are extracted from the ground and contain impurities that when burned can release toxic gases.

Does the manufacturing process use electricity? Yes, but the electricity is provided by solar, wind or geothermal energy. This makes the entire manufacturing process 100% renewable.

Is the manufacturing process dangerous? No, it involves a series of safe chemical transitions that can be performed in a relatively small factory located anywhere.

Are fossil fuel emissions generated to build the fuel plant? Yes, in the same way as all other renewable energy solutions do. However, we are working hard to limit plant development emissions as much as possible. Our plants are brand new, constructed to modern design principles and to the latest environmental regulations. The raw materials used to create our machinery and the plants themselves (e.g. steel, concrete, electronics etc.) meet current industry standards and we strive to source fossil-free products from companies within these industries when available, such as steel manufactured using green hydrogen. Most other renewable technologies including wind turbines, solar panels, electric car factories and the electric cars themselves also create fossil emissions during the manufacture of related materials and machinery.

Product use and cost

What vehicles can Zero® Syn95™ be used in? It is a direct drop-in fuel, which means it can be used by any vehicle that runs on 95 RON fossil fuel petrol (i.e. standard 'pump fuel' on every forecourt) without the need for any modifications whatsoever.

What modifications need to be made on a vehicle to use it? Any vehicle that uses fossil fuel petrol will not require any modifications to use Zero® fuel.

Will it react with normal petrol in my car? No, it is a drop-in fuel and will naturally mix with any remaining fossil fuel in a tank. As such, while it would ideally be used exclusively in place of traditional petrol it can be mixed without any problem at all.

Does it offer the same range as normal petrol? It can achieve a greater range than the E5 (5% ethanol) or E10 (10% ethanol) fuels used in the UK and the same range as traditional petrol before the introduction of E5/E10 ethanol ingredients.

Is it as powerful as petrol? It is more powerful than the E5 (5% ethanol) or E10 (10% ethanol) fuels.

What does it cost? The fuel is currently available on pre-order in very limited supply. This fuel is produced from a small batch production and is priced to reflect its value as a unique and very rare special edition. Once production is scaled, the target sale price of the commercially available fuel will be in line with fossil fuel prices.