HYDRA S-1750

Converts Nato One Fuel F34 (JP-8) or F35 (Jet A1) to Nato F63
Suitable for all Diesel Engines

NATO Part No: NSN 6850-99-238-3567

HYDRA®

Features & Advantages

- Increase cetane by up to 8 points.
- Contains cetane booster 2-ethylhexylnitrate (2EHN).
- With extra lubricants to protect engine.
- Improves performance & economy.
- Improves cold start and reduce white smoke.
- Prevents from harmful emission.
- Reduces white smoke.
- Reduces noise from engine.
- Reduces diesel engine knock.
- Dilution rate, 1:1,000 (1,000PPM).
- Improves fuel combustion by reducing the ignition delay period.

Description

The overall quality of fuel is dependent on a number of factors. These include BTU value, viscosity, pour flow point, aromatic and paraffinic content, and resistance to contaminant build-up such as water and bacteria.

A fuel's quality also is very dependent on its cetane number.

The cetane number (CN) is an index of the ignition point or combustion quality of fuel and is measured using an ASTM D613 test.

Standard NATO aviation kerosene JET A-1 and JP-8 normally has a minimum cetane number of around 43. Whilst depending on engine design, driving conditions, and so on. The optimum cetane value requirement for most diesel engine vehicles is around the mid to high 50s.

Matching cetane to the engine is important in order to maximise the engine's performance. Kerosene based fuels in particular, usually start with a much lower cetane number so cetane improvement for these fuels is essential.

A fuel with too low of a cetane number for a particular engine will result in reduced cold-start ability, rough running, excess engine noise/vibration and reduced combustion quality.

This leads to reduced performance, excess emissions, and carbon build-up throughout the engine and emission system components (intake, EGR, DPF etc).

A higher cetane fuel that is a proper match for the engine will reduce ignition delay, improve overall combustion quality, liberate more BTU (energy) from the fuel, and improve performance and MPG.

It also will reduce engine noise, deposit build-up, and exhaust emissions. Fuels with cetane number lower than minimum engine requirements can cause rough engine operation. They are more difficult to start, especially in cold weather.

Many low cetane fuels, increase engine deposits resulting in more smoke, increased exhaust emissions and greater engine wear.

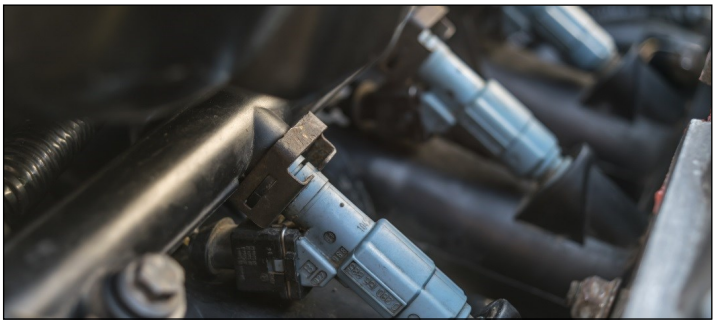
Using fuels which meet engine operating requirements will improve cold starting, reduce smoke during start-up, improve fuel economy, reduce exhaust emissions, improve engine durability and reduce noise and vibration.

Hydra S-1750 delivers an increase in cetane number to your JET A-1 & JP-8 fuel. It will increase cetane number by up to 8 points depending on quality of fuel being treated.

It provides an economic route to meeting quality specifications and a platform for creating premium fuels.

Improves fuel combustion by reducing the ignition delay period resulting in: easier cold starting, reduction in white smoke, harmful emission reduction and reduced noise from engine. Better fuel combustion means improved fuel economy.

Description



Lubricity

One of the problems that may arise in practice when using kerosene-based fuels for vehicles with diesel engines is caused by the poorer lubricating properties of jet fuels produced from lighter fractions of kerosene.

Lower lubricity may not cause an instant damage to an engine, but may affect the reliability and durability of diesel engines in a long-term perspective. It can cause the fuel pumps to burn out as they relay on the fuels lubricating properties to protect them.

Cetane Boosting

Active cetane improvers are essentially a form of fuel modification, or more accurately, combustion modification.

Alkyn nitrates offer the greatest improvement in cetane number, with measured increases of up to eight points.

When it comes to alkyn nitrates, 2-ethylhexyl nitrate (2-EHN) is the most popular and most respected.
It offers more consistent ignition quality whilst reducing unwanted and negative combustion conditions.

Adding 2-EHN will also reduce lubricity, therefore it is essential that a lubricant is also blended into the fuel to reduce its dryness.

Considering the quality parameters, i.e. the cetane number and lubricity, jet fuels F-35 and F-34 treated with the fuel additive **Hydra S-1750** increases the cetane number whilst also increasing the lubrication properties of the treated fuel, this is less than the maximum HFRR wear scar diameter of 460µm.

Enabling the treated fuel to be used in all vehicles and equipment with diesel engines.

Best Performance

By combining 2-EHN and lubricants in one easy to use product i.e. **Hydra S-1750** we can turn the most mediocre fuels into super diesel that will outperform the best premium pump fuels.

Hydra S-1750's low temperature and low sulphur lubricants improve quality even further.

It contains a minimum 95% 2-EHN with the remainder composed specialist low temperature lubricants that protects the entire fuel system against the harmful effects of low lubricity, low Sulphur fuels.

This results in an optimum combustion condition, maintaining comprehensive fuel system protection with performance increase, and reduction in harmful exhaust emissions.

Fuel Freezing Temperatures

It is important that any fuel additive does not lower the temperature of the treated fuel.

Product	Freezing Point
Fuel JP-8	-47ºC
Jet A1	-47ºC
2-EHN	-50ºC
Hydra S-1750	-51ºC

Usage

Use with JET Fuel Additive dosing systems or can be added directly to fuel tank then top up with new fuel. Fuel tanks being treated should be at least 10% full. Dilution Rate: 1:1,000 (1 litre m^3) can be used at up to 1:500 (2 litre m^3).

All of our products are manufactured to the highest specifications at our UK plant, which is accredited to **ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018.**

Laboratory Facilities

Hydra International Ltd.'s Research & Development Laboratories are a hub of activity where new products are developed and formulated. We have working relationships with our raw material suppliers, many of these suppliers are major world-wide chemical manufacturers with their own development laboratories.

As a company we are well known in the chemical industry for being receptive to cutting edge new chemicals which can be incorporated into our products to achieve performance advantages. An important part of the International Standards that we hold is that of constant improvement. We show that we have achieved this at every independent audit.

Lubricity

The lubricity of jet fuels treated with the additive **Hydra S-1750** is better than standard diesel fuel, and without it is poorer than the lubricating properties of diesel fuel. Untreated Jet Fuels do not satisfy the required maximum norm of HFRR 460 µm.

Fuel Property Parameters

Fuel Property parameters	Diesel fuel test method	Aviation fuel test method	Diesel fuel (Grade C)	Aviation fuel JET A-1 (F-35)		Aviation fuel JP-8 (F-34)	
				without additive	with Hydra S-1750	without additive	with Hydra S-1750
Hydrocarbon mixtures			C10 – C29	C8 – C18		C8 – C18	
Fraction, °C			180–350	140–230		140–230	
Density at 15 °C, kg/m3	LST EN ISO 12185	ASTM D 4052	843.6	797.2	797.2	791.2	791.2
Net heating value, MJ/kg	LST ISO 8217	ASTM D 4529	43.10	43.30	43.27	43.23	43.23
Cetane number	LST EN ISO 5165		51.3	42.3	48.5	40.6	45.2
Lubricity, corrected wear scar diameter (wsd 1,4) at 60 °C, µm	LST EN ISO 12156		277 (max 460)	611	426	822	424
Cold filter plugging point (CFPP), °C Freezing point, °C	LST EN 116	ASTM D 2386	–7	–58	–58	–60.3	–60.4
Sulphur, mg/kg	LST EN ISO 20846	ASTM D 5453	8.9	11	11	11	11

References

ASTM D 1655-15	Standard Specification for Aviation Turbine Fuels. American Society for Testing and Materials.
ASTM D 2386-06: 2012	Standard Test Method for Freezing Point of Aviation Fuels. American Society for Testing and Materials.
ASTM D 4052-11	Standard Test Method for Density, Relative Density, and API Gravity of Liquids by Digital Density Meter. American Society for Testing and Materials.
ASTM D 4529-01	Standard Test Method for Estimation of Net Heat of Combustion of Aviation Fuels. American Society for Testing and Materials.
ASTM D 5453-12	Standard Test Method for Determination of Total Sulfur in Light Hydrocarbons, Spark Ignition Engine Fuel, Diesel Engine Fuel and Engine Oil by Ultraviolet Fluorescence. American Society for Testing and Materials.
LST EN 116: 1999	Diesel and domestic heating fuels – Determination of cold filter plugging point.
LST EN ISO 5165: 1999	Naftos produktai. Dyzelinio kuro užsidegimo kokybės nustatymas. Variklinis cetano metodas [EN ISO 5165: 1998, Petroleum products – Determination of the ignition quality of diesel fuels – Cetane engine method (ISO 5165: 1998)].
LST ISO 8217: 2012	Naftos produktai. Kuras (F klasė). Jūrų laivų techniniai reikalavimai (tapatus ISO 8217:2012) [Petroleum products – Fuels (class F) – Specifications of marine fuels (ISO 8217: 2012 identical)]. McDonnell, K. P.; Ward, S. M.; McN
LST EN ISO 12156-1: 2007	Dyzelinas. Tepumo įvertinimas naudojant didelio dažnio slankiojamojo judesio stendą (MFRR) [EN ISO 12156-1: 2006, Diesel fuel – Assessment of lubricity using the high-frequency reciprocating rig (HFRR) – Part 1: Test method (ISO 12156-1: 2006)].
LST EN ISO 12185: 1999	Žalia nafta ir naftos produktai. Tankio nustatymas. Vibracinis U vamzdelio metodas [Crude petroleum and petroleum products – Determination of density – Oscillating U-tube method (ISO 12185: 1996 + ISO 12185: 1996/Cor.1: 2001)].
LST EN ISO 20846: 2004	Naftos produktai. Sieros kiekio automobiliniuose degaluose nustatymas. Ultravioletinės fluorescencijos metodas [EN ISO 20846: 2004, Petroleum products – Determination of sulphur content of automotive fuels – Ultraviolet fluorescence method (ISO 20846: 2004)].

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