

WHO BENEFITS FROM ASPEN DIESEL FUEL?

MAN, MACHINE AND ENVIRONMENT!



THE STORY OF A FUEL FOR PEOPLE WHO CARE, FROM 1988 TO THE PRESENT DAY!

Aspen was established in Sweden in 1988, by former Volvo engineer and entrepreneur Roland Elmäng. His aim was to improve occupational safety for forestry workers who were handling gasoline all day long, working among harmful chainsaw vapors and exhaust gases*.

The result was Aspen alkylate – the natural choice for those who care. By introducing

Aspen D, a diesel fuel, Aspen also improves occupational health and safety for all professionals who use small diesel engines and as such are more exposed to the fuel compared to drivers of conventional vehicles. Suitable for plate compactors, excavators, generators, tool carriers, and heaters.



IN SHORT...

REGULAR DIESEL CONTAINS HARMFUL SUBSTANCES REGULATED BY THE AUTHORITIES – ASPEN D CONTAINS LESS!

The focus on local and regional emissions was intensified worldwide in the mid- to late 1970s, resulting in changes to fuel regulation, such as limiting the sulfur and aromatics content of fuels. (1, 2)

ASPEN D CONTAINS LESS SULFUR COMPARED TO CONVENTIONAL DIESEL.

The amount of sulfur in diesel fuel is directly linked to the amount of pollution produced when the fuel is burned in an engine. Higher levels of sulfur increase pollutants. (1 p. 17, 2)

ASPEN D CONTAINS LESS AROMATICS AND PAH COMPARED TO CONVENTIONAL DIESEL, SEE TABLE 1.

It has previously been reported that **high aromatics content** worsen engine cleanliness and also increase engine deposits. (2, 3)

The International Agency for Research on Cancer (IARC) has classified several polycyclic aromatic hydrocarbon (PAH) compounds as probable or possible human carcinogens. (4)

NO FATTY ACID METHYL ESTER (FAME) IS ADDED TO ASPEN D.

Regular diesel contains substances limiting the storage life of the fuel. Aspen D contains less of those substances. No bioesters are added. **Fatty Acid Methyl Ester (FAME)** is more prone to oxidize compared to conventional diesel consisting of only hydrocarbons. (1 p. 54)

The slightly more polar nature of the FAME molecule results in an increased tendency to attract water compared to conventional diesel, which should be taken into account to prevent microbial growth. (1 p 54, 5)

*In the late 1980s, forestry workers in Scandinavia reported adverse health problems, such as headaches and nausea (i), which were believed to be caused by gasoline exhaust fumes (ii). Around the same time in America, the results of a study conducted by the International Agency for Research on Cancer (IARC) indicated that exposure to vapor and exhaust gases could be the reason loggers were getting blood cancer (iii).

(i) Official state investigation, published by The Swedish Transport Agency (Transportstyrelsen). Available for download: [https://data.kb.se/datasets/2015/02/sou/1995/File name: 1995_30 \(librisid_17492006\).pdf](https://data.kb.se/datasets/2015/02/sou/1995/File%20name%3A%201995_30%20(librisid_17492006).pdf). 1995. (p36)

(ii) Swedish state investigation into the technical specification of Alkylate fuel; TSV 2012-256. 2014-05-23. (p11)

(iii) IARC Monographs, publication by International Agency for Research on Cancer. <http://monographs.iarc.fr/ENG/Monographs/vol100F/mono100F-24.pdf> (p257)

ASPEN D COMPARED TO CONVENTIONAL DIESEL STANDARDS.

		CAN	US	US CA	EUROPE	ASPEN D
Diesel Standard		CAN/CGSB-3.517-2015	ASTM D975-15c	CARB diesel	SS-EN 590:2013	
Total aromatics	vol%	Not reg.	≤ 35	≤10	Typical 15	≤1
Di-aromatics and higher	wt%	Not reg.	Not reg.	Not reg.	≤ 8	Included in total aromatics
PAH (polyaromatic hydrocarbon)	vol%	Not reg.	Not reg.	Not reg.	Not reg.	≤ 0.02
Sulfur	mg/kg (ppm)	≤15	≤15	≤15	≤10	≤ 5
FAME	vol%	≤1	≤ 5	≤ 5	≤ 7	≤ 0.1



Properties of the fuel	Benefits for small diesel machine users
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MAN	
<ul style="list-style-type: none"> • Lower aromatics and sulfur content • Formulated, quality assured, packaged, and batch marked by Aspen 	<ul style="list-style-type: none"> • Less human hazards associated with the fuel (*) • Safe and flexible fuel handling

MACHINE	
<ul style="list-style-type: none"> • Lower content of unstable diesel • No added FAME • Significantly lower content of components that can contribute to unclean engines and increase deposit formation 	<ul style="list-style-type: none"> • Fuel quality is assured three times longer than conventional diesel (**) • Absence of FAME keeps moisture away, hence a less favorable growth environment for bacteria • Cleaner engine and maintained power

ENVIRONMENT	
<ul style="list-style-type: none"> • 90% renewable content • Significantly lower content of hazardous components • The formulation is not classified as hazardous to the environment (*) 	<ul style="list-style-type: none"> • A 90% renewable fuel that can be used in your existing machines • Less impact on global and local environment

References

- Worldwide Fuel Charter 5th edition**
International Automobile and engine manufacturers have defined recommendations for fuels in "World Wide Fuel Charter" (WWFC).
https://www.acea.be/uploads/publications/Worldwide_Fuel_Charter_Sed_2013.pdf
- US Environmental Protection Agency (EPA)**
<https://www.epa.gov/diesel-fuel-standards/about-diesel-fuels#diesel-fuels>
Miller, C., Weaver, C.S., and Johnson, W., "Diesel Fuel Quality Effects on Emissions, Durability and Performance", Final Report EPA Contract 68-01-65443, Sept. 30, 1985.
- International Energy Agency – Advanced Motor Fuels (IEA-AMF)**
http://www.iea-amf.org/content/fuel_information/diesel_gasoline
The International Energy Agency (IEA) is an autonomous intergovernmental organization established within the framework of the Organization for Economic Co-operation and Development (OECD) in 1974 in the wake of the 1973 oil crisis. The IEA acts as a policy adviser to its member states, but also works with non-member countries, especially China, India, and Russia. Advanced Motor Fuels (AMF) implements agreements for advanced motor fuels with the vision of a sustainable transportation system that uses advanced, alternative, and renewable fuels to reduce emissions of GHGs and air contaminants.
- International Research on Cancer, IARC, p 36**
<https://monographs.iarc.fr/ENG/Monographs/vol92/mono92.pdf>
- International Energy Agency – Advanced Motor Fuels (IEA-AMF)**
http://www.iea-amf.org/content/fuel_information/fatty_acid_esters/compatibility

(*) According to Globally Harmonized System of Classification and Labelling of Chemicals (GHS)
(**) Oxidation test according to EN15751:2009 performed as a function of storage time, performed at Saybolt SE Gothenburg