

C.A.R.E. Diesel®



Sustainable Diesel Fuel from
Renewable Resources



For all diesel engines • very high storage stability • nearly CO₂ neutral



C.A.R.E. Diesel®



Fossil Diesel

TOOL-FUEL

innovative · environmentally friendly · economical

TOOL-FUEL sells high-quality diesel fuels and fuel oils obtained from renewable raw materials. They are low in emissions, almost CO₂-neutral, stable at low temperatures and have excellent storage stability. They can be used immediately without adaptation to any vehicle engine requiring diesel fuel, or heating systems.

As a result of a special refinery process, our partner, Neste Oil, has developed the basic substance, HVO (Hydrotreated Vegetable Oil), which has all the benefits of a renewable raw materials fuel with advanced power, without the need to accept the disadvantages of a conventional biodiesel.

TOOL-FUEL has more than 25 years of experience in the production, analysis and sales of fuels and additives. The name says it all. We sell fuels that are among the „tools“ which reduce the environmental footprint, as well as the dependency on fossil fuels.

TOOL-FUEL fuels stand for premium quality and economic attractiveness and exceed the requirements for conventional fuels by far.

C.A.R.E. Diesel® is different

With the world's leading provider of low-emission fuels from renewable resources, Neste Oil, as a strong partner, we market and sell C.A.R.E. Diesel®, an innovative diesel fuel. By the use of an effective special process, it is a diesel fuel composed of renewable raw materials that can be introduced into any diesel engine without requiring modification to the equipment.

C.A.R.E. Diesel® is organic, but not conventional biodiesel.

C.A.R.E. Diesel® is a different product, and has nothing in common with conventional biodiesel (FAME EN 14214). Yet, all of the positive properties of biodiesel are present, without any of the disadvantages.

C.A.R.E. stands for

- C.: CO₂-Reduction
- A.: Arctic Grade
- R.: Renewable
- E.: Emission Reduction

” *Based on our 25 years of experience,
We offer you the best possible advice and
the highest product quality.*



How does C.A.R.E. Diesel® affect vehicles?

SECURITY IN THE TANK

C.A.R.E. Diesel® is extremely resistant to aging, noticeably reduced corrosion, and has excellent cold flow properties and storage stability. This means that the fuel is also particularly suitable for seasonally-used engines, since the problems associated with „diesel oil residue“ is not possible. With C.A.R.E. Diesel®, included deposits at the bottom of the tank and deposits of impurities at low temperatures are a thing of the past.

CLEANLINESS IN THE FUEL FILTER

The excellent cold flow properties, purity and outstanding stability of C.A.R.E. Diesel® minimize the risk of a blockage of the filter significantly. Traditional Biodiesel (FAME) contains waxes and foreign substances that tend to clog the filter in winter. C.A.R.E. Diesel® does not have these problems.

EXHAUST SYSTEM: LESS SOOT & FUEL CONSUMPTION

C.A.R.E. Diesel® burns cleaner due to a lack of aromatics and an extremely high cetane number. The reduced soot formation increases the recovery time intervals of particulate filters and exhaust after-treatment systems. This ultimately means less fuel required to burn away the soot deposits.

REFUELLING

C.A.R.E. Diesel® is a largely paraffinic diesel fuel according to CEN TS 15940. Due to its aromatics-free composition, C.A.R.E. Diesel® is less harmful to the environment (Water hazard class I) and all persons, when exposed to the fuel's environment and emissions.

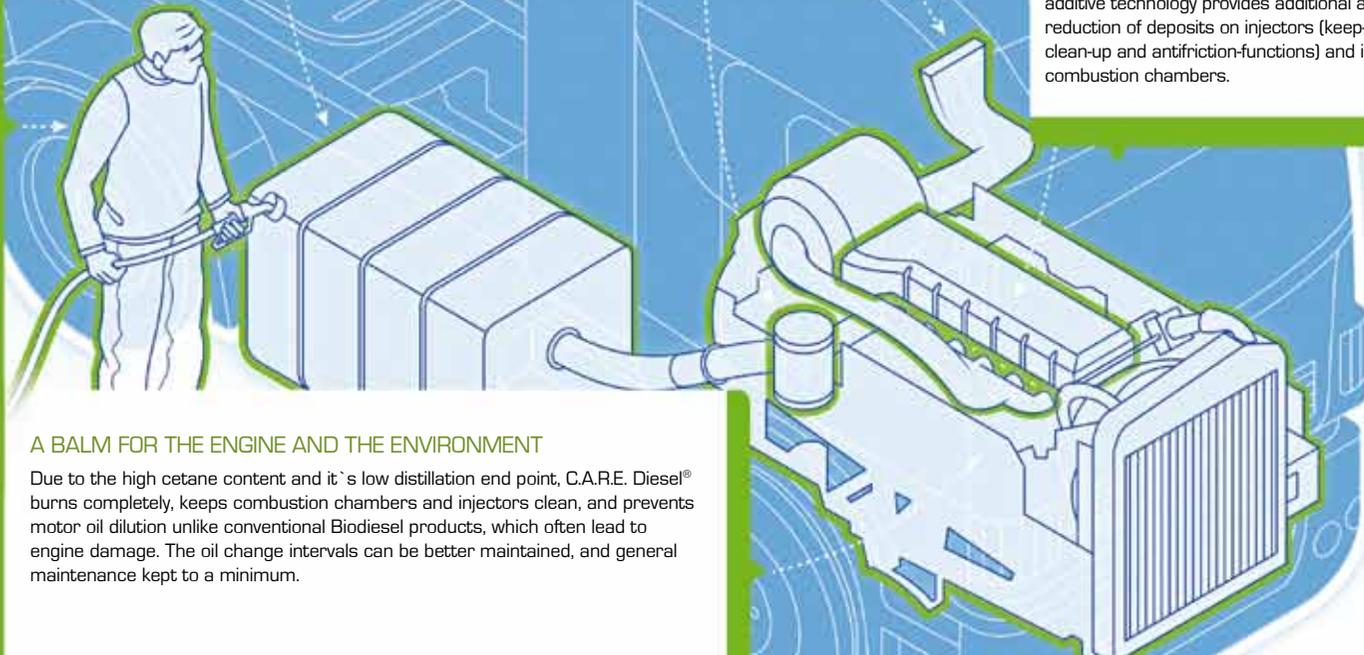
Comparison of C.A.R.E. Diesel® and Fossil Diesel

Fossil Diesel

H332: Harmful if inhaled
H351: May cause cancer
H375: May cause damage to organs with persistent and repeated contact
H411: Toxic to aquatic organisms with long lasting effects
H315: Causes skin irritation
H304: May be fatal if swallowed and enters airways

C.A.R.E. Diesel®

EUH066: Repeated exposure may lead to dryness and cracking of the skin
H304: May be fatal if swallowed and enters airways



LESS WEAR AND TEAR IN THE FUEL INJECTION SYSTEM

Due to the outstanding lubricity of C.A.R.E. Diesel®, the sensitive Diesel injection pumps are protected against wear. The fuel offers protection against corrosion for the entire fuel system. The use of the most advanced additive technology provides additional aid for a reduction of deposits on injectors (keep-clean, clean-up and antifriction-functions) and in the combustion chambers.

A BALM FOR THE ENGINE AND THE ENVIRONMENT

Due to the high cetane content and its low distillation end point, C.A.R.E. Diesel® burns completely, keeps combustion chambers and injectors clean, and prevents motor oil dilution unlike conventional Biodiesel products, which often lead to engine damage. The oil change intervals can be better maintained, and general maintenance kept to a minimum.

Renewable diesel.

The largest range of different raw material classes in the biofuel industry.

Benefit to the Environment:

All raw materials are cultivated in a sustainable method and are fully traceable to plantations and production, from which they derive.

C.A.R.E. Diesel® meets the strict sustainability criteria, as set by the European regulation and standards governing biofuels. Thus, for example, the clearing of forests and wetlands, peatlands, and areas with high biodiversity is strictly prohibited for the cultivation of raw materials.

The value chain of C.A.R.E. Diesel® is regularly verified by independent auditors to ensure compliance with all environmental protection issues.

Advantages Compared to Fossil Diesel Fuel:

- Cleaner combustion
- Excellent cold operability
- Excellent engine tolerance and high emission reduction potential

Advantages over Conventional Biofuels:

- Can be used in pure form without engine adaptation
- Excellent miscibility with fossil diesel
- Extremely resistant to aging
- Compatible with existing systems
- No upgrading or modification of vehicles required

Environmental Effects of C.A.R.E. Diesel®:

- Less nitrogen oxides
- Less particulate matter
- Less carbon dioxide
- Less hydrocarbons
- Reduces 'Greenhouse Gas` (GHG) emissions

Possible Raw Materials



Animal Fats from Food Processing



Waste fats from fish processing



Residues from vegetable oil processing



Rapeseed oil, Soybean oil, Camelina oil, Jatropha oil, Palm oil, Corn oil, Pine oil pitch



Buses and Trucks Make Environmentally Friendly Logistics

The logistical challenges of the near future - more goods, longer transport distances, less emissions - require new, environmentally friendly solutions.

C.A.R.E. Diesel®, unlike conventional biodiesel, can fully replace fossil diesel with fewer emissions. It is suitable for all diesel engines and may be, in its pure form, i.e. without blending, used by fossil diesel engines.

OPTIBIO – Trendsetting Field Trial

Between 2007 and 2010, a total of 300 commercial vehicles manufactured by Scania and IVECO were tested with the C.A.R.E. Diesel® basic substance. The vehicles were driven about 50 million kilometres; 1.5 million km where only the 100% product was used. The test results confirm that it is easily the equivalent of conventional diesel and can replace it without further modifications.

Based on these excellent results, the Scania-manufactured regional and intercity buses with DC9 engines have been operating since 2010 with the low-emission C.A.R.E. Diesel® basic substance.

The Advantages of a C.A.R.E. Diesel® fleet

- Upgrading or conversions of vehicles or supply systems are not required.
- Lower service / maintenance costs than for conventional biofuels
- Significant reductions of environmentally damaging emissions can be expected
- Less clogging of the particle filter due to greatly reduced particulate emissions

Environmental Impact of C.A.R.E. Diesel®

The reduction of polluting emissions is gaining favour in urban environments worldwide and it is becoming increasingly important to the health of the community.

Here, C.A.R.E. Diesel® for both truck and bus fleets, is the forward-looking decision.

” *The results of the first year show that the fuel works perfectly in Mercedes Benz trucks and buses. Our engines are compatible with this fuel with no problems*
Dr. Schuckert, Daimler AG.

Agricultural and Mining Machinery

'Bad Air' is a thing of the past

Benefits of C.A.R.E. Diesel®

- Excellent engine tolerance, high emission reduction potential
- Excellent cold operability
- Economical vehicle operation
- Excellent compatibility with existing systems
- No upgrades or retrofitting of vehicles, facilities, or fuelling stations necessary
- Extended life of particle filters
- Reduced particulate emissions

Protection of Workers - Possibility and Obligation

Lower emissions lead to lower workplace exposure to pollutants. This applies, in particular, with respect to the re-evaluation of diesel emissions by the World Health Organization (WHO), in which all the exhaust gases / particles that arise from fossil diesel were classified as carcinogenic.





Marine Diesel

C.A.R.E. Diesel®'s high quality is especially recommended for recreational and commercial boating. It is odorless, emission-reduced, environmentally friendly, cold resistant, and has a very long shelf life.

Sustainable and Climate-Friendly

C.A.R.E. Diesel® is almost CO₂-neutral, renewable, and climate-friendly. The product is recognized, approved, and ISCC certified to the biomass / bioenergy guidelines prescribed by the German Federal Government. C.A.R.E. Diesel® corresponds to the Austrian Standard ONR CEN / TS 15940.

Used Without Restrictions

C.A.R.E. Diesel® requires no special handling or different storage methods, so it is suitable for diesel engines in recreational boating without further modifications. It is fully integrated and compatible with existing distribution and logistics systems and requires no additional investment in this area.

Outstanding quality, shelf-stable and cold-resistant

C.A.R.E. Diesel® significantly exceeds the quality requirements (EN 590) for diesel fuels (with the exception the minimum density) and is clearly superior in performance to both conventional biodiesel and fossil diesel. It has, by virtue of the very high cetane number and purest composition, a performance enhancing quality without requiring additives. In addition, C.A.R.E. Diesel®

has a very slow aging and high storage stability factor, and in extreme temperatures, this diesel fuel is cold resistant.

C.A.R.E. Diesel® for more safety at sea

Until this time, operators of all craft have avoided the addition of biodiesel (FAME) to fossil diesel because of the much higher water content; almost always leading back to serious incidents in operation. The cause is normally shown to be a fuel filter clogged by the deposits left by residue. This problem is impossible with C.A.R.E. Diesel® on the basis of its chemical properties. With the added assurance of C.A.R.E. Diesel® purity, even the seasonal boater with a diesel drive can enjoy a trouble-free experience while reducing emissions.

Clean-burning and Odor-free

- Significant emission reduction
- GHG reduction
- Less 'cold start' emissions
- No water problem or filter clogging
- Clean fuel injectors, valves and combustion chambers
- Colourless
- Water hazard class 1
- No microbial in-fuel or filter growth
- Constant flow
- No typical diesel odour in the ship
- Drastically reduced soot deposits on the hull



Fuel Station Solutions

The future does not have to be complicated

We have developed an effective and easily implementable tank concept for C.A.R.E. Diesel®.

Our stations are based on a modular solution and can be constructed on any surface. Following the establishment of a Fuelling Station Operation, TOOL-FUEL will deliver our powerful and durable C.A.R.E. Diesel® product, at regularly scheduled intervals; filling the storage containers. Our compact container fuelling stations can be supplied in different sizes and colours, as required by the ownership.

Depending on the needs of your operation, we are able to work with you to know what designs work best for your Company, and which concepts are most suitable for your location

” We have used C.A.R.E. Diesel® since 2013 for our trucks. There were no changes necessary. The fuel is to be very well recommended. We are pleased that with the use we are conserving nature.”

Reinhard Humenberger-Riesenhuber,
Humenberger-Riesenhuber GesmbH,
Logistics



Already in Proven Practice

Already, more than 2,500 trucks using the environmentally friendly, completely renewable energy product, C.A.R.E. Diesel®, are on the roads daily. On request, we will gladly make more reports available from our satisfied users. Here is a prime example of how C.A.R.E. Diesel® has proven itself in practice:

Experience Report:
Sponsor of the Racing Team TUNING AKADEMIE

TOOL-FUEL and Neste Oil are the official sponsor of the „Tuning Academy“, supporting an Audi A4 Quattro with a 3.0-liter TDI engine.

The Team has participated for several years in the VLN Endurance series on the Nürburgring Racetrack successfully, and has been involved in numerous class wins.

Our fuel is under the extreme test conditions of auto racing here and is continuously being optimized.



Successfully tested by Lufthansa

Experience Report
Project 'burnFAIR' : Facts

Duration: July 15 to December 27, 8 flights / day
Route: Hamburg - Frankfurt – Hamburg (1 hour flight)
Aircraft: Airbus A321
Biodiesel Quantity: 800 tons
Biodiesel ratio: 50% in a machine
Emissions saved: 1,500 tonnes of CO₂ (min)



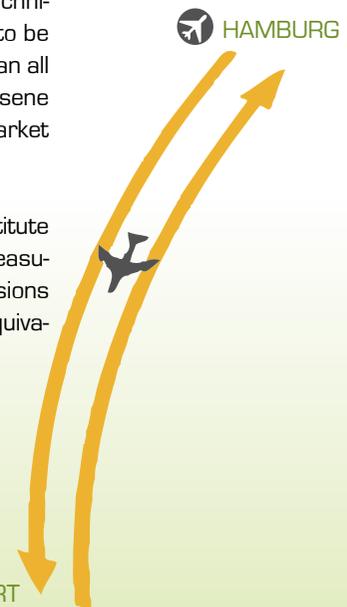
C.A.R.E. Diesel®'s product; that of Neste Oil produced HVO (Hydrotreated Vegetable Oil), was used by Lufthansa in the research project 'burnFAIR' in an Airbus A321. The product was successfully tested on regularly scheduled flights for the Hamburg to Frankfurt route. After receiving all flight-relevant authorizations, the company received the fuel mix consisting of 50% HVO and 50% conventional aviation kerosene and this continues as a fuel in passenger aircraft.

Project 'burnFAIR' Summary of Results:

From 15 July to 27 December 2011, the Lufthansa Airbus A321 flew eight times daily between Hamburg and Frankfurt as part of the research project 'burnFAIR'. As part of the test, one engine was powered by 50 percent biofuel. The CO₂ savings, according to initial calculations, were approximately 1,500 tonnes for the 6-month period.

In a press release Lufthansa said: „After 1187 flights with bio-synthetic fuel,“ presented Joachim Buse, Vice President, Aviation Biofuel Deutsche Lufthansa AG, “the first results are now in Berlin for detailed technical analysis. Bio-kerosene can easily be expected to be used in flight operations. technical investigations ran all positive and we could demonstrate that bio-kerosene is no more pollution-producing than was the market kerosene.“

From Manfred Aigner, Director of the DLR Institute of Combustion Technology in Stuttgart: „Our measurements have shown that the bio-kerosene emissions compared to typical high kerosene is at least equivalent.“



		C.A.R.E. Diesel®		ONR CEN/TS 15940 Class A / Austria		DIN EN 590 Germany		ASTM D975 USA		C.A.R.E. Diesel® Typical Values *
		min	max	min	max	min	max	min	max	
Cetane Number		70		70		51		40		76
Density at 15 °C	kg/cbm	770	790	765	800	820	845			779
Flash Point	°C	60		> 55		> 55		52		68
Sulphur	mg/kg		5		5		10		15	< 5
V40	mm/s	2,0	4,0	2,0	4,5	2,0	4,5	1,9	4,1	2,9
Distillation to 250 °C	Vol%		< 65				< 65			3,7
Distillation to 350 °C	Vol%	85				85				100
90% Vol% Point	°C	282	320					282	338	288
95% Vol% Point	°C		360		360		360			292
Total Pollution	mg/kg		10		24		24			< 0,05
Neutralisation Number	mgKOH/g		0,2				0,2			< 0,03
Conradson Carbon	weight%		0,1				0,3			0,01
Copper Corrosion	Korr.-Grad		1		1		1		3	1
Oxidation Stability	g/cbm		25		25		25			4
Oxidation Stability	h	20		20		20				> 40
CFPP										
Summer	°C		-22				0			-27
Transition	°C		-22				-10			-29
Winter	°C		-35				-20			-38
Ash Content	weight%		0,01		0,01		0,01		0,01	0,001
Water Content	mg/kg		200		200		200		500	34
Lubricity	um		460		460		460		520	330
Polycyclic Aromatic Hydrocarbons	weight%		0,1				8			< 0,1
Total Aromatics	weight%		1		1				35	< 0,1
Fatty Acid-Methylester (FAME)	Vol%		0,0		7,0		7,0			0

* Average values that may vary slightly in each individual case.

C.A.R.E. Diesel® in Comparison with National and International Specifications

Germany

TOOL-FUEL Services GmbH

Große Elbstraße 145e
22767 Hamburg

Phone +49 (0) 40 - 22 86 85 45

Mobile +49 (0) 171 - 180 18 12

www.tool-fuel.de

office@tool-fuel.de

Vienna / Austria

TOOL-FUEL GmbH Austria

Bahnstraße 7
2345 Brunn am Gebirge

Phone +43 (2236) 31 782 135

Fax +43 (2236) 31 782 185

www.tool-fuel.at

office@tool-fuel.at

Luxembourg

TOOL-FUEL Luxembourg S.à.r.l.

1a, am Enneschte Flouer
L-6692 Moersdorf

Phone +352 - 27 86 04 39

Mobile +49 (0) 152 - 09 21 52 27

www.tool-fuel.lu

office@tool-fuel.lu



Information now online at
toolfuel.eu