



CarbonClear

The marine, offshore and rail industries urgently needs to reduce regulated emissions, driven by regulations and internal business requirements. Sustainable fuels are seen as the answer, however these are higher cost, have detrimental impact on engines & fuel systems and often require modifications to fleets.

Fuel additives have advanced significantly in the last decade to meet these challenges. Combined with modern engines becoming more susceptible to fuel issues and fuel quality fluctuations, fuel additives are increasingly sought-after as an oven-ready means of reducing carbon usage, reducing fuel spend and improving fleet reliability. Their use has become widespread in other medium to heavy duty diesel-using industries where decarbonisation has become a priority.

CarbonClear is a fuel additive with over 20 years pedigree utilising cutting edge chemistry with a range of OEM approvals. The product is designed to keep new engines clear or clean up older engines.

CarbonClear is primarily designed for rail engines, offshore engines & workboats such as OSV's, Tugs, Ferries and Superyachts. These industries share common characteristics that complement the chemistry of CarbonClear. The product now treats over 100 million litres of middle distillate fuel for users requiring rapid decarbonisation.

Principal Benefits

CarbonClear is designed for use primarily in rail, offshore and workboats such as OSV's, Tugs, Ferries and Superyachts where middle distillate fuels, industrial engines & heavy duty cycles are utilised.

Emissions Reduction

CO₂ (Carbon Dioxide), NO_x (Nitrous Oxides), SO_x (Sulphur Oxides), PM (Particulate Matter), HC (Hydrocarbons).

Decarbonisation

5-10% CO₂e reductions from improved combustion efficiency and reduced fuel consumption.

Engine Improvement

3-5% Power (kW) & Torque (Nm).

Commercial

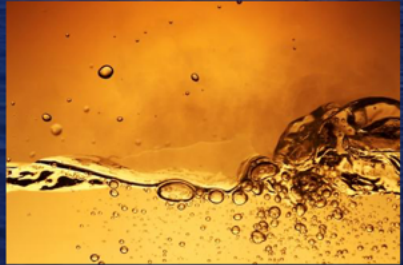
3-5% reduced fuel spend.



Which Fuels?

CarbonClear has been tested and found effective in all middle distillate diesel fuels including EN590, BS2869 and ISO8217 marine grade fuels. This includes modern sustainable fuels such as fuel emulsions and biodiesel blends (up to B50).

In UK heavy duty diesel, the product treats over 100 million litres of BS2869:A2 Gas Oil per year. The product is not designed for residual fuels.

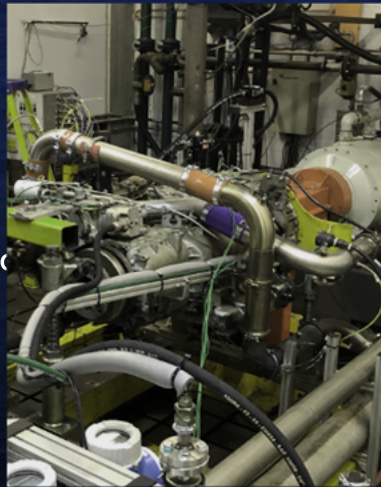


Which Engines?

The chemistry in this product is designed to be used in heavy duty diesel engines using middle distillate fuels like EN590, BS2869 and ISO8217. Heavy duty diesel engines suffer from accelerated loss in performance due to their duty cycles and fuel storage conditions as well as difficulty in reducing CO₂ emissions through other means.

CarbonClear is used heavily in European forecourt fuels and in greater volumes with 'premium fuels'. If you drive a diesel car or truck in Europe today there is a 90% chance you are already using the chemistry of **CarbonClear** at a much higher price.

Other users include nearly all major UK railways including the entire Scottish rail network where marine engines & equivalent fuels are used in locomotive traction, nearly all diesel trains into London (South Western & Govia Thameslink).



Certification

Hundreds of engine tests have been performed at Millbrook proving ground, Millbrook Leyland test facility and millions of hours running time. Fuelcare have generated ISO8178 data from both Cummins & MTU engines through extensive duty cycle test cell trials. The detergent composition is Lloyd's Registry approved (Product Verification Service) and now has ClassNK approval in commercial shipping.



Injection Systems for Marine Fleets



CarbonClear can be used in conjunction with Fuelcare's proprietary fuel additive injection systems (A.I.S.).

Using the Fuelcare injection system on board ensures the product is dosed precisely, safely and without human intervention.

Fuelcare's injection systems have been installed on marine fleets with direct connections to their fuel fill line flow meters for injection accurately into the fuel stream.

Fuel Chemistry

CarbonClear Improves Lubricity (to ISO12156), Oxidation (to ISO12205) & Thermal Stability (to ASTM D6468), Corrosion caused by high TAN fuels (to ASTM D665 A & B), reduces Fuel Injector Fouling (to CEC F-23-01 Peugeot XUD9) and risk of Filter Blocking (to IP387).

Fuelcare is a private British company that specialises in improving fuel quality. Our head office & laboratory based in Shrewsbury, U.K., is dedicated to fuel engineering. Fuelcare staff are members of the Energy Institute & IASH (Stability, Handling & Use of Liquid Fuels).



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