

## CarbonClear™

**Description** CarbonClear is a fuel additive system formulated to improve emissions, reduce fuel consumption, and protect fuel from common contaminants in modern middle distillate fuels like diesel & gas oil. The system comprises of a multi-function detergent chemistry with wide ranging engine approvals, and an automated injection system for automated dosing.

CarbonClear achieves benefits through improved fuel performance in combustion as well as improved protection during storage & handling. Fuel systems and engines are protected from premature wear, fouling and corrosion, as well as the adverse effects of renewable content in modern middle distillate fuels.

CarbonClear is an ashless product and does not add to particulates/emissions loading. The main benefits of the detergent formulation have been verified by Lloyd's Register Product Verification Service.



### Benefits Emissions

Reduction in CO<sub>2</sub> (Carbon Dioxide), NO<sub>x</sub> (Nitrous Oxides), SO<sub>x</sub> (Sulphur Oxides), PM (Particulate Matter) & HC (Hydrocarbons) with further CO<sub>2</sub>e reductions as a result of improved combustion efficiency and reduced fuel consumption.

### Storage

Improves Lubricity (to ISO12156), Oxidation (to ISO12205) & Thermal Stability (to ASTM D6468), protects against the presence of Biodiesel (F.A.M.E.), 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).

### Combustion

Reduces fuel consumption typically by 3-5%, as well as similar improvements in Power & Torque. Reduces risk of premature wear to fuel pumps and fuel injection equipment through clean-up of engine deposition or maintenance of already-clean engines.

**Fuels** CarbonClear has been tested and found effective in all middle distillate diesel fuels (EN590, ISO8217), fuel emulsions, HVO and biodiesel blends (up to B50). The product is not designed for residual fuels.

**Applications** CarbonClear is designed for use primarily in rail, bus, offshore, power generation and marine engines including workboats such as OSV's, Tugs, Ferries and Superyachts where middle distillate fuels & industrial engines are utilised.

**Availability & Dosing** CarbonClear can be supplied as an integrated system. A small additive injection installation on a vessel or fuel terminal contains tanks for the additives. During refilling the system automatically doses the additive in the correct ratio without human intervention. The additives come in 5kg, 20kg or 215kg drums. CarbonClear is dosed by volume. The recommended dosage rate is 1:1000. This equates to 1000ml per 1m<sup>3</sup> of fuel or 1000ppmv.



**Approvals** All ingredients REACH registered. Lubricity performance proven by independent tests – HFRR and Bosch. No harm tests showing no adverse effects to fuels, lubricants, and fully compatible with engine and system materials. The product has no impact on fuel specification at the correct dose rate and is passively approved under all O.E.M.'s.

|                            |                           |                      |
|----------------------------|---------------------------|----------------------|
| <b>Physical Properties</b> | <b>Appearance/Odour</b>   | Clear amber liquid   |
|                            | <b>Viscosity (@ 40°C)</b> | 25mm <sup>2</sup> /s |
|                            | <b>Density (@ 15°C)</b>   | 925kg/m <sup>3</sup> |
|                            | <b>Flash Point</b>        | 61°C                 |
|                            | <b>Pour Point</b>         | >51°C                |

**Safety & Support** Before using this product, consult the Material Safety Data Sheet (M.S.D.S.) for details on product hazards, recommended handling precautions and product storage.

**Personal Protection** Use chemical splash goggles and face shield (ANSI Z87.1 or approved equivalent). Eye protection worn must be compatible with respiratory protection system employed. Chemical-resistant gloves should be worn whenever this material is handled.

**First Aid** Consult the Material Safety Data Sheet (MSDS) for full details. Inhalation: Move to fresh air. Give artificial respiration if breathing has stopped. If symptoms persist, call a physician. Wash skin thoroughly with soap and water or use recognised skin cleanser. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse. Eye contact: Rinse immediately with plenty of water for at least 15 minutes. Immediate medical attention is required. Ingestion: Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless

directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Disposal** Disposal of this product, solutions and any by-products should always comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. The classification of the product may meet the criteria for a hazardous waste. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

**Spillage** Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

**Contact** Fuelcare Laboratories are available to provide specialised technical support to all of our customers. Our services available include identification of fuel contamination issues & engine malfunctions, fuel testing, design of treatment programs with CarbonClear, monitoring of CarbonClear levels in fuel samples, advice and assistance on procedures for engine issues. To contact Fuelcare:

- Call +44 (0)1743 360784 (U.K.) or +1-512-643-4874 (U.S.)
- Email [sales@fuelcare.com](mailto:sales@fuelcare.com)
- Website [www.fuelcare.com](http://www.fuelcare.com), product page: [www.fuelcare.com/](http://www.fuelcare.com/)

#### Notes

1. The detergent is approved under the Lloyds Product Verification Service as well as containing Class NK approval.
2. NOx reductions may rise with improved combustion, but lower emissions overall produce a net reduction. Adblue systems in modern diesel engines will remove NOx in any case.
3. Lloyds PVS & Class NK approval is registered under the Octamar™ LI-5 Plus brand.

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