# FuelClear M68 Fuel Biocide Product Datasheet

**Description**

FuelClear M68 Fuel Biocide is a high-performance antimicrobial agent (microbicide) from Fuelcare, developed specially to combat the problems of microbial contamination and spoilage in hydrocarbon fuels.


FuelClear M68 is effective at low use levels, against microbial species commonly encountered in fuel systems, including bacteria, yeast, and mould. FuelClear M68 is designed to cause inhibition of microbial growth upon contact, and quickly result in cell death. FuelClear M68 is effective in systems containing both fuel and water. Unlike other fuel treatment biocides, the active ingredients in FuelClear M68 are not deactivated by water.

FuelClear M68 contains an active ingredient of 5-chloro-2-methyl-3(2H) isothiazolone and 2-methyl-3(2H) isothiazolone (C.M.I.T./M.I.T.) in a 3:1 mixture ratio. FuelClear M68 is a solution of the technical grade of the active ingredient, C.M.I.T./M.I.T. at a nominal value of 1.5% of active substance.

**Microbial Growth in Fuels**

As water finds its way into fuel storage tanks, often observed as fuel haziness, microorganisms breed, forming slime and emulsion that leads to filter blockage and corrosion of metal tanks. Once transported, the contaminated fuel contains the accumulated bacteria and fungi which cause the blockage of downstream filters, pumps and injectors.

**Fuels**

FuelClear M68 has been tested and found effective in a wide range of middle distillate hydrocarbon fuels, including diesel fuels, biodiesel blends (up to B50), gas oils, kerosene, heating oils, petrol (gasoline) and fuel emulsions.

**Applications**

FuelClear M68 is used in a wide range of industries including marine, automotive, rail, agriculture, power generation and home heating applications. Note – the product is currently not approved for aviation.

**Availability**

FuelClear M68 is supplied in 250ml containers. Stock is held in Shrewsbury U.K. for distribution worldwide.

**Aviation**

This product is currently not approved for aviation. Contact Fuelcare.

**Non-Aviation Application**

| Dosage Type | Preventative (v/v) | Curative (v/v) | Shock (v/v) |
|---|---|---|---|
| **Contamination Level** | No evidence of microbial contamination | Evidence of microbial contamination | Heavy microbial contamination |
| **Dosage Rate (ppm)** | 150ppm | 300ppm | 1000ppm |
| **Dosage Rate (Biocide : Fuel)** | 1:6666 | 1:3333 | 1:1000 |
| **Min. Contact Time** | n/a | 12 Hours | 6 Hours |

Always use FuelClear M68 in accordance with local regulatory requirements (i.e. E.U. Biocides Products Regulations) and O.E.M. guidelines, and do not exceed recommended dose levels. Extreme care must be taken to avoid the addition of a preventative/maintenance level dosage of FuelClear M68 to a heavily contaminated fuel system.

The biocide should be added in such a manner so as to allow good mixing and uniform distribution of the biocide across the fuel. Ideally, FuelClear M68 should be dosed into a flowing fuel stream in the storage tank inlet. Tanks must be at least 10% full before dosing and preferably fill the tank after dosing. Do not dispense into empty fuel tanks.

Where possible, water and sludge should be removed from fuel tanks before dosing FuelClear M68 and also after the retention period. If this is not feasible, filters should be checked more frequently for a short period, due to microbial slimes being killed off and dislodged. FuelClear M68 is not surface active and therefore will not inhibit water separation.

At 300ppm a minimum retention time of 12 hours should be maintained but this may be reduced at the higher dosage rates. In general, the higher the concentration of biocide, the shorter the contact time required for a more complete kill but in all cases 24 hours retention is sufficient. The higher dosage rates in these circumstances will also help to improve filter fuel flow in the short term.

**Efficacy**

Treatment with FuelClear M68 will kill off bacterial and fungal contamination and assist the breakdown of slimes and coagulated biological sludges. This will help to prevent filters from blinding, and allow clean fuel to flow normally.

An extra advantage is the elimination of the often deep emulsion layer at the fuel/water interface which will facilitate water removal by draining or by the fuel line separator. It is this emulsion that is often the critical problem when it

enters the fuel line after fuel contents of a tank are disturbed or shaken.

Fuel treated with FuelClear M68 will remain protected from contamination over extended periods of time. It will also resist contamination if re-inoculated from other sources.

**Broad Spectrum Activity**

FuelClear M68 is effective at very low use levels against microbial species (bacteria, fungi, yeasts) commonly encountered in fuel systems. Minimum inhibitory concentration values of FuelClear M68 against a range of microorganisms are noted in the table below:

| Organism Type | Organism | ATCC | M.I.C. (ppm A.I.) |
|---|---|---|---|
| **Mould** [a] | Hormoconis resinae [c] | 22712 | 3 |
| **Yeast** [b] | Candida albicans | 16651 | 1.5 |
| | Candida lipolytica [c] | 16617 | 1.5 |
| **Bacteria** [b] | Citrobacter freundii | 6750 | 1.5 |
| | Enterobacter aerogenes | 13048 | 0.375 |
| | Escherichia coli | 11229 | 1.5 |
| | Proteus mirabilis | 4675 | 1.5 |
| | Pseudomonas aeruginosa [c] | 33988 | 0.375 |
| | Pseudomonas oleoverans | 8062 | 0.375 |

[a] MIC at 7 days, [b] MIC at 48 Hours, [c] Hydrocarbon utilising microorganism

**Rapid Treatment**

FuelClear M68 causes immediate inhibition of growth on coming into contact with a microorganism. Growth inhibition rapidly becomes irreversible and results in cell death. The time to achieve eradication varies according to the extent of contamination and the type of microbes present, but will typically be between 6 and 36 hours.

**Long Term Preservation**

Fuel treated with FuelClear M68 will remain protected from contamination over extended periods of time. It will also resist contamination if reinoculated from another source. In studies conducted over an 8-week period, contaminated fuels were treated with fuel biocides. Once microbial control was established, the fuel was reinoculated with microbes, to measure long term protection capability FuelClear M68 was not dosed for a second

time. The initial dose was still able to protect against bacteria and fungi.

**Complete System Protection**

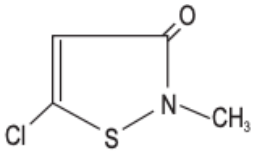
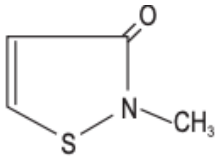
The partitioning characteristics of FuelClear M68 ensure that it is present in both the fuel and water phases. This facilitates eradication of contamination in the water bottom as well as protection of the fuel as it is transferred through the distribution system.

**Approvals**

The active ingredient is registered with CASRN (55965-84-9), EC-No. (911-418-6) and Index No. (613-167-00-5). REACH registered product.

**Composition & Use**

A broad-spectrum fuel biocide consisting of 5-chloro-2-methyl-3(2H) isothiazolone and 2-methyl-3(2H) isothiazolone (C.M.I.T./M.I.T.).

| | C.M.I.T. | M.I.T. |
|---|---|---|
| **Structure** |  |  |
| **Name** | 5-chloro-2-methyl-4-isothiazolin-3-one | 2-methyl-4-isothiazolin-one |
| **Formula** | $C_4H_4ClNOS$ | $C_4H_5NOS$ |
| **Ratio** | 3 | 1 |

**Physical Properties**

| | |
|---|---|
| **Appearance/Odour** | Yellow liquid with a mild odour |
| **pH** | 4-6 |
| **Specific Gravity** | 1.044 kg/l |
| **Viscosity (@ 25°C)** | 97.8 CpS |
| **Volatility** | Non-volatile (no contribution to VOC) |

| | |
|---|---|
| **Freezing Point** | < -20°C (-4°F) |
| **Storage Conditions** | Min. ≥ -15°C (≥ 5°F), Max. ≤ 55°C (≤ 131°F) |

**Safety & Support**

Before using this product, consult the Material Safety Data Sheet (MSDS) 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.

**Handling**

- Irritating to skin.
- Risk of serious damage to eyes.
- May cause sensitization by skin contact.
- Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. See MSDS for full safety data.

**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.
- Skin Contact: IMMEDIATELY get under a safety shower. Remove contaminated clothing. Wash off with soap and water. Immediate medical attention is required. Wash contaminated clothing before re-use. Do not take clothing home to be laundered. Discard contaminated shoes, belts, and other articles made of leather.
- Eye contact: Rinse immediately with plenty of water for at least 15 minutes. Immediate medical attention is required.
- Ingestion: Drink 1 or 2 glasses of water. IMMEDIATELY see a physician. Never give anything by mouth to an unconscious person.

**Disposal**

As with most biocides, FuelClear M68 can be toxic to aquatic organisms. Water bottoms and effluents must therefore be diluted prior to discharge and discharged in accordance with local environmental and legal regulations. FuelClear M68 is biodegradable and is non-persistent in the environment. Dilution to below effective levels will facilitate its degradation - the greater the dilution factor the more rapid is the degradation. For guidance on approved discharge procedures, please contact Fuelcare or consult local authorities.

**Spillage**

Neutralisation methods will vary depending on the situation the biocide is in. In cases of accidental spill or excess biocide in equipment (or other situations when the product is not being applied), the biocide can be neutralised by the addition of a 5% solution of Sodium Bicarbonate (NaHCO3) and 5% Sodium Hypochlorite (NaOCl) in water. Apply solution to the spill area or product at a ratio of 10 volumes deactivating solution per estimated volume of biocide. After 30 minutes, flush the spill area or equipment with excess amounts of water, to a chemical sewer (if in accordance with local procedures, permits, and regulations). DO NOT add deactivation solution to a waste pail

to deactivate adsorbed material. If the product is to be neutralised after application (for example, in tank water bottoms before disposal), a slightly acidic 10% solution of Sodium Metabisulphite (NaS2O5) or Sodium Bisulphite (NaHSO3) can be used, in the ratio of 4:1 (Deactivating solution: FuelClear M68). Chemical deactivation of large amounts of FuelClear M68 must not take place in bulk storage tanks. The effluents must be isolated safely before deactivation. Further information regarding spill procedures can be found in the (SDS).

**Transport** ADR/RID, UN 3265, CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.(Mixture of: 5-chloro-2-methyl-2H-isothiazol-3-one and 2-methyl-2H- isothiazol-3-one (3:1)), Class 8, Group III. Limited Quantity in 5 Litres/5kg.

**Contact** Fuelcare Laboratories are available to provide specialised technical support to all of our customers. Our services available include:

- Identification of sources of contamination.
- Fuel Testing
- Design of treatment programs with FuelClear M68.
- Monitoring of FuelClear M68 levels in fuel samples.
- Advice and assistance on procedures to avoid the recurrence of microbial growth.

To contact Fuelcare:

- Call +44 (0)1743 360784 (U.K.) or +1-512-643-4874 (U.S.)
- Email sales@fuelcare.com
- Website www.fuelcare.com, product page: www.fuelcare.com/fuelclear-m68

Version: 1.1
Revision Date: 18/10/21
Print Date: 18/10/21