

FuelClear™ M15 Fuel Biocide Product Datasheet

Overview FuelClear M15 Fuel Biocide is a high-performance antimicrobial agent (microbicide) from Fuelcare, developed specifically to combat the problems of microbial contamination and spoilage in liquid hydrocarbon fuels. FuelClear M15 is effective at low use levels, against microbial species commonly encountered in fuel systems, including bacteria, yeast, and mould. FuelClear M15 is designed to cause inhibition of microbial growth upon contact, and quickly result in cell death. FuelClear M15 is effective in systems containing both fuel and water. Unlike other fuel treatment biocides, the active ingredients in FuelClear M15 are not deactivated by water.



FuelClear M15 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 M15 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.

Approvals Both active ingredient and tradename (FuelClear M15) have been notified and approved under the E.U. Biocides Products Regulations (B.P.R.).

This biocidal substance has been approved under the E.U. Biocidal Products Directive and the Tradename approved for Product Type 6 under the CMIT/MIT Biocidal Product Family. 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.

The product is approved by NATO, United Kingdom & Danish Militaries in non-aviation fuels. The NATO stock code (NSN) is 6840-99-339-6004.

Microbial Growth 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 M15 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.

Industries FuelClear M15 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 but approval is being sought.

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Directions for Use Always use FuelClear M15 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 M15 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 M15 should be dosed into a flowing fuel stream in the storage tank inlet – please contact Fuelcare for suitably approved dosing systems. Other methods of application, such as bulk dosing, will not affect the performance of FuelClear M15, but might extend the treatment time required. 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 M15 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 M15 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.

Dosage Rates

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

* If your filtration is less than 10µm, please contact Fuelcare for further advice.

Rapid Treatment FuelClear M15 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 M15 will remain protected from contamination over extended periods of time.

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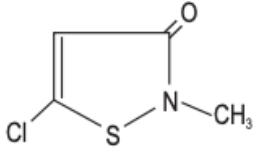
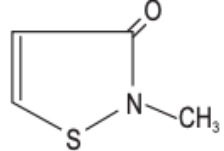
It will also resist contamination if reinoculated from another source. In studies conducted over an 8-week period, contaminated fuels were treated with fuel biocides. Once microbial control was established, the fuel was reinoculated with microbes, to measure long term protection capability FuelClear M15 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 M15 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.

Composition and 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-3-one
Formula	C ₄ H ₄ ClNOS	C ₄ H ₅ NOS
Ratio	3	1

Physical Properties

Appearance/Odour	Yellow liquid with a mild odour
pH	4-6
Specific Gravity	1.044 kg/l at 25°C
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)

Broad Spectrum Activity

FuelClear M15 is effective at very low use levels against microbial species (bacteria, fungi, yeasts) commonly encountered in fuel systems. Minimum inhibitory concentration values of FuelClear M15 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

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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

Safety and 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 M15 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 M15 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 (NaHCO_3) 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 (NaS_2O_5) or Sodium Bisulphite (NaHSO_3) can be used, in the ratio of 4:1 (Deactivating solution: FuelClear M15). Chemical deactivation of large amounts of FuelClear M15 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 MSDS.

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 our customers. Our services available include:

- Identification of sources of contamination.
- Fuel Testing
- Design of treatment programs with FuelClear M15.
- Monitoring of FuelClear M15 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.)
- Email sales@fuelcare.com
- Website www.fuelcare.com, product page: www.fuelcare.com/m15