

FuelClear AV15 Fuel Biocide Product Datasheet

Description FuelClear AV15 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 AV15 is effective at low use levels, against microbial species commonly encountered in fuel systems, including bacteria, yeast, and mold. FuelClear AV15 is designed to cause inhibition of microbial growth upon contact, and quickly result in cell death. FuelClear AV15 is effective in systems containing both fuel and water. Unlike other fuel treatment biocides, the active ingredients in FuelClear AV15 are not deactivated by water.

FuelClear AV15 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 AV15 is a solution of the technical grade of the active ingredient, C.M.I.T./M.I.T. in Dipropylene Glycol at a nominal value of 1.5% of active substance. Both active ingredient and tradename (FuelClear AV15) have been notified and approved under the E.U. Biocides Products Regulations (B.P.R.).



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 AV15 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 AV15 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 currently being sought.

Availability FuelClear AV15 is supplied in 5kg, 20kg, 215kg & 1,000kg containers. 5kg and 20kg containers are typically held ex-stock and other sizes available with longer lead times on request. Stock is held in Shrewsbury & Aberdeen, U.K. for distribution worldwide.

Aviation This product is currently not approved for aviation but approval is currently being sought. 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 AV15 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 AV15 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 AV15 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 FuelClear AV15, 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 AV15 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 AV15 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 AV15 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 AV15 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 AV15 is effective at very low use levels against microbial species (bacteria, fungi, yeasts) commonly encountered in fuel systems. Minimum inhibitory concentration values of FuelClear AV15 against a range of microorganisms are noted in the table below:

Organism Type	Organism	ATCC	M.I.C. (ppm A.I.)
Mold ^(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 AV15 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.

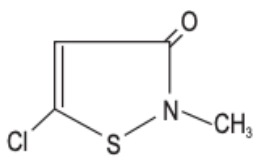
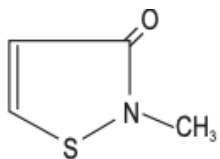
Long Term Preservation Fuel treated with FuelClear AV15 will remain protected from contamination over extended periods of time. It will also resist contamination if reinoculated from another source. In studies conducted over an 8-week period,

contaminated fuels were treated with fuel biocides. Once microbial control was established, the fuel was re-inoculated with microbes, to measure long term protection capability FuelClear AV15 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 AV15 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. BPR approval will be sought shortly but is not yet required at present.

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.) & Dipropylene Glycol.

	C.M.I.T.	M.I.T.
Structure		
Name	5-chloro-2-methyl-4-isothiazolin-3-one	2-methyl-4-isothiazolin-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
	Viscosity (@ 25°C)	97.8 CpS

The information contained in this document is provided free of charge and is based on technical data that Fuelcare believes to be reliable. It is intended for use by persons having technical skill and at their own discretion and risk. Fuelcare accepts no liability for any loss, damage or expense arising from, or in connection with, the use of the information. Furthermore, none of the contents of this publication should be taken as a license to operate under any patent, nor as a recommendation to infringe any patent. **USE BIOCIDES SAFELY. ALWAYS READ THE LABEL AND PRODUCT INFORMATION BEFORE USE. FOR PROFESSIONAL USERS ONLY.**

Solvent	Dipropylene Glycol
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 AV15 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 AV15 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 ($\text{Na}_2\text{S}_2\text{O}_5$) or Sodium Bisulphite (NaHSO_3) can be used, in the ratio of 4:1 (Deactivating solution: FuelClear AV15). Chemical deactivation of large amounts of FuelClear AV15 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 Not regulated for transport (ADR/RID/IMO-IMDG / IATA/ICAO).

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 AV15.
- Monitoring of FuelClear AV15 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

Version: 1.0
Revision Date: 01/04/20
Print Date: 01/04/20