



BIO/TEC 14 MICROBICIDE

BIO/TEC 14 is a high performance biocide for preserving metalworking and metal cleaning fluids. It has extremely broad-spectrum activity controlling bacteria, fungi, molds, and yeasts, while being compatible with most components in a formulation. Its very low use levels make **BIO/TEC 14** one of the most cost-effective biocides on the market.

Chemical Composition

	<u>% Active</u>
5-Chloro-2-methyl-4-isothiazolin-3-one	10.2%
2-Methyl-4-isothiazolin-3-one	3.8%
Total active ingredients	14.0%
Inert Ingredients	
Magnesium salts	23.0%
Water	63%

Typical Properties

Appearance:	Clear Amber liquid
Odor:	Mild aromatic
Specific Gravity:	1.20 @ 25°C
pH:	1.5 – 3.0

Advantages

- Bactericide and fungicide
- Isothiazolone Blend
- Broad-spectrum Microbiological Control
- Economical, Easily Fed Liquid
- Environmentally Friendly
- Cost Effective

Compatibility

Isothiazolones are generally compatible with most components of industrial formulations. However, the presence of a few agents will cause degradation of the active ingredients. Strong reducing agents including thiols, mercaptans, sulfides, bisulfites, metabisulfites, secondary amines and other nucleophiles must be avoided in formulations. Additionally, strong oxidizing agents, such as hypochlorites, will degrade isothiazolones. Conditions of high heat greater than 50°C for extended periods of time and/or pH above 9 will lead to loss of activity.



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Biocidal Performance

BIO/TEC 14 isothiazolinones are a very cost effective preservative system due to the extremely low use levels required to control various microorganisms. While the specific use levels are application dependent, the following MIC (minimum inhibitory concentration) values for **BIO/TEC 14** actives are indicative of the effectiveness of the product.

Bacteria

Gram-Negative	ATCC No.	PPM active Isothiazoline
Achromobacter parvulus	4335	6
Alcaligenes faecalis	8750	6
Enterobacter aerogenes	3906	9
Escherichia coli	11229	9
Flavobacterium suaveolens	958	9
Klebsiella pneumoniae	13883	9
Proteus vulgaris	8427	9
Pseudomonas aeruginosa	15442	9
Pseudomonas cepacia	25416	9
Pseudomonas fluorescens	13525	9
Pseudomonas oleovorans	8062	6
Salmonella choleraesuis (typhi)	6539	9
Shigella sonnei	9290	9
Serratia marcescens	8100	9
Gram-Positive		
Brevibacterium ammoniagenes	6871	9
Bacillus cereus	11778	9
Bacillus subtilis	6633	9
Sarcina lutea	9341	9
Staphylococcus aureus	6538	11
Staphylococcus epidermis	155	9
Staphylococcus agalactiae	624	9



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Fungi

Asperigillus niger	9642	> 11
Asperigillus oryzae	10196	11
Chaetomiumglobosum	6205	9
Gliocladium fimgriatum	32913	>11
Mucor rouzii	24905	>11
Penicillium funciculosum	9644	11
Pullularia (Aureobasidium) pullulans	9348	>11
Rhizopus stolonifer	10404	11

Yeast

Candida albicans	11651	9
Rhototorula rubra	9449	9
Saccharomyces cerevisiae	2601	9

Treatment of Metalworking Fluids

The guideline for the maintenance of a non-fouled system is to use **BIO/TEC 14** microbiocide at a rate of 10 fluid ounces per 1,000 gallons of fluid every four weeks. Monitor the system to confirm that microbial control is being maintained.

For a fouled system, use **BIO/TEC 14** at a rate of 16 fluid ounces per 1,000 gallons of fluid. Continue to dose at this level of **BIO/TEC 14** until control has been regained as determined by microbial testing of the fluid. Dosage rate and/or frequency is also dependent upon a number of other factors, such as the rate of dilution of the preservative with the makeup fluid, the nature and severity of contamination, level of control required, filtration effectiveness, system design, etc.

Years of use of the **BIO/TEC 14** isothiazolones for tankside treatment of metalworking fluid systems has shown that shock dosing a system with 1 gallon of **BIO/TEC 14** to 8,000 gallons of metalworking fluid has demonstrated optimum performance. Maintaining a system by monitoring the level of microbial contamination and adding **BIO/TEC 14** at a rate of 1 gallon per 8,000 gallons of fluid when microbial contamination is detected will optimize the use of the **BIO/TEC 14** and prevent losing control of the system which may result in having to dump and recharge with fresh fluid.



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The **BIO/TEC 14** is available in various container sizes to facilitate the dosing of the biocide at a place in the system to assure uniform dispersion. Manual addition of the biocide into a return flume to the central tank should provide adequate mixing of the biocide. **BIO/TEC 14** can also be automatically dispensed into a metalworking fluid system using a metering pump available from Southwest Engineers.

Metal Cleaning Fluid Preservation

BIO/TEC 14 microbiocide is recommended as a preservative for use in the manufacture and use of alkaline, acid and emulsion-based metal cleaning fluids typically used in electroplating, phosphatizing, galvanizing, and general metal cleaning operations.

For addition to a metal cleaning concentrate, add **BIO/TEC 14** microbiocide at a level to ensure that the final use-dilution fluid will contain 56 to 225 ppm of product.

For addition to a fouled system, add 16 to 23 fluid ounces of **BIO/TEC 14** microbiocide to each 1,000 gallons of use-dilution metal cleaning fluid. Continue to dose at this level of **BIO/TEC 14** until control has been regained as determined by microbial testing of the fluid. A higher dosage rate and/or increased frequency of treatment may be required, depending upon rate of dilution of the preservative with makeup fluid, the nature and severity of contamination, level of control required, filtration effectiveness, system design, etc.

Safety Precautions

All isothiazolones are both corrosive and potential skin sensitizers. As such, keeping these solutions away from the skin is essential. Due diligence must be maintained while handling the chemistry at all times. When working with isothiazolone products, use the proper personal protective equipment to ensure that you do not come into contact with the product. Even if the slightest spill were to be absorbed onto a person's clothing, it may work its way through and cause a delayed skin burn. If significant aerosolization occurs, then an appropriate self-contained breathing apparatus may be needed. Refer to the MSDS for the most current information on the proper personal protective equipment.

Please refer to the label information and the MSDS for the most up-to-date information.

Packaging

BIO/TEC 14 is available as a liquid in 1-gallon "tip and measure" jugs, 5-gallon translucent graduated pails, 30-gallon and 55-gallon drums and 330-gallon totes.