

Biocides Market: The Emerging Battlefield Against Microbially Influenced Corrosion (MIC)

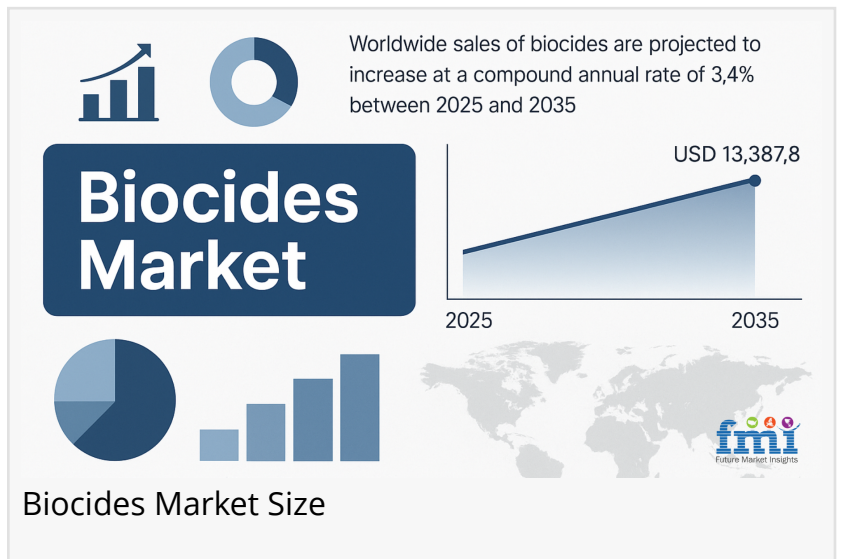
Biocides play a critical yet under-recognized role in preventing microbially influenced corrosion (MIC), reshaping industrial corrosion control strategies.

NEWARK, DE, UNITED STATES, June 8, 2025 /EINPresswire.com/ -- The [biocides market](#) is often discussed in the context of water treatment, paints and coatings, personal care, and agriculture. However, one of the most critical and least recognized applications of biocides lies in the realm of corrosion control, particularly microbially influenced corrosion (MIC). This unique aspect of the market is gaining traction in industries where infrastructure degradation poses a severe operational and financial threat. As industries like oil & gas, pulp & paper, and marine engineering seek advanced solutions for extending equipment life and improving system efficiency, the demand for biocides tailored to combat MIC is quietly yet steadily reshaping market dynamics.

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The MIC segment is emerging as a key growth driver in the biocides market, as industries prioritize asset longevity and system efficiency in harsh operating environments.”

Nikhil Kaitwade, Associate Vice President at Future Market Insights



Microbially Influenced Corrosion (MIC) is a significant concern in various industries, particularly in oil & gas, marine engineering, and infrastructure. It refers to the deterioration of metals and non-metallic materials caused by the presence and metabolic activities of microorganisms. Unlike general corrosion, which is largely chemical or electrochemical, MIC is biologically driven, often accelerated by bacteria such as sulfate-reducing bacteria (SRB), iron-oxidizing bacteria, and acid-producing

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microbes. These organisms form biofilms on metal surfaces, creating localized corrosive environments that can significantly reduce the lifespan of pipelines, storage tanks, cooling systems, and marine vessels.

Corrosion: A Silent Threat in the Oil and Gas Industry – Future Market Insights Report

<https://www.futuremarketinsights.com/reports/sample/rep-gb-2806>

This form of corrosion is insidious. It typically develops undetected beneath microbial colonies, making it difficult to diagnose until substantial damage has occurred. According to research from the National Association of Corrosion Engineers (NACE), MIC is responsible for over 20% of all corrosion-related failures in the oil and gas industry.

Biocides: A Frontline Defense Against MIC

Biocides serve as a frontline defense against MIC by targeting and eliminating the microbial agents responsible for initiating the corrosion process. Unlike traditional [corrosion inhibitors](#) that merely prevent the electrochemical reactions causing rust or pitting, MIC-specific biocides interrupt the microbial life cycle, dismantling the biofilms that shelter corrosive bacteria.

Key biocidal compounds used in this application include glutaraldehyde, tetrakis hydroxymethyl phosphonium sulfate (THPS), and isothiazolinones. These agents are preferred for their broad-spectrum antimicrobial activity and compatibility with other chemical treatments used in industrial systems. In oilfields, for instance, glutaraldehyde-based biocides are injected into pipelines and water injection systems to control SRB populations that thrive in anaerobic environments.

Real-world Applications of Biocides in MIC Mitigation

The use of biocides for MIC mitigation is far from theoretical. Across various sectors, real-world implementations underscore the rising importance of these chemicals in protecting high-value assets.

In the North Sea oilfields, offshore platforms routinely battle the corrosive threat posed by SRB in subsea pipelines. A case study conducted by the Oil and Gas Technology Centre (OGTC) documented a 40% reduction in corrosion rate over 18 months following the introduction of a tailored biocide treatment program targeting MIC. This intervention not only extended the lifespan of critical infrastructure but also averted potential environmental hazards from pipeline leaks.

Biocides Market: A Growing Industry – Future Market Insights Report

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Similarly, the pulp and paper industry faces persistent issues with microbial slime formation in paper machines and recirculating water systems. These microbial communities foster acidic microenvironments that degrade [stainless steel](#) components. Biocides, especially oxidizing variants like chlorine dioxide, have been instrumental in reducing both microbial load and

associated corrosion, leading to improved system hygiene and lower maintenance costs.

In marine settings, the threat of biofouling—where marine organisms colonize ship hulls and ballast water tanks—has an additional MIC dimension. Corrosive microbes embedded within biofilms accelerate pitting and crevice corrosion in ballast water tanks. The International Maritime Organization (IMO) has set regulations for ballast water management, indirectly pushing shipping operators to adopt biocide-based treatments not just for ecological compliance but also to protect vessel integrity.

Corrosion is a global problem that costs the world's economy an estimated \$2.5 trillion annually. The biocides market, traditionally segmented by product type and application industry, is now witnessing a shift toward function-specific demand. MIC-focused biocides represent a niche yet fast-growing subsegment. According to recent industry analysis by Future Market Insights, the demand for industrial biocides tailored to microbial corrosion prevention is projected to grow at a compound annual growth rate (CAGR) of over 3.4% from 2025 to 2035, outpacing broader market averages.

This growth is being driven by rising infrastructure investments in harsh environments, where corrosion risk is inherently high, and by stricter performance standards for asset integrity. As industries move toward predictive maintenance and digital corrosion monitoring, the use of biocides is increasingly being embedded into long-term corrosion management plans rather than treated as reactive measures.

While the efficacy of MIC-targeted biocides is undisputed, their environmental footprint is coming under closer scrutiny. Regulatory agencies across North America and Europe are tightening limits on biocide discharge, particularly those with high toxicity or persistence in aquatic ecosystems. In response, manufacturers are developing next-generation biocidal formulations with improved biodegradability and lower environmental impact.

For example, THPS-based biocides have gained popularity due to their rapid breakdown in the environment and minimal accumulation in sediments. Innovations in controlled-release formulations and encapsulation technologies are also enabling more precise dosing, reducing overall chemical usage while maintaining microbial control.

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As industries grapple with the silent yet devastating effects of microbially influenced corrosion,

biocides are stepping into a critical role that extends beyond traditional antimicrobial applications. The growing recognition of MIC as a major threat to industrial reliability is transforming the biocides market, creating opportunities for innovation and specialization. Far from being a peripheral concern, MIC control is emerging as a central consideration in the design and operation of industrial systems. In this context, MIC-focused biocide solutions represent not only a compelling growth frontier but also a vital component of global infrastructure resilience.

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By Grade:

- Food Grade
- Pharmaceutical Grade
- Industrial/ Technical Grade

By Product Type:

- Halogen Compounds
- Metallic Compounds
- Organic Acids
- Organo-sulfurs
- Nitrogen
- Phenolic
- Others

By End Use:

- Agrochemicals
- Food & Beverages
- Water Treatment
- Paints & Coatings
- Cosmetics & Personal Care
- Oil & Gas
- Pulp & Paper
- Wood Preservatives
- Cleaning Agents
- Others

By Region:

- North America
- Latin America
- Europe

- Asia Pacific (APAC)
- Middle East & Africa (MEA)

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n-Propyl Acetate Market: <https://www.futuremarketinsights.com/reports/propyl-acetate-market>

2-EthylHexyl Acetate Market: <https://www.futuremarketinsights.com/reports/2-ethylHexyl-acetate-market>

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