

# Corrosion Inhibitors

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US Industry Study with Forecasts for 2020 & 2025

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Study #3409 | April 2016 | \$5300

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## Corrosion inhibitors demand impacted by water use

The corrosion inhibitor industry is being impacted by a number of changes. For water treatment applications, key issues include increased water recycling, the use of lower quality water in cooling systems, operating under higher temperatures and at greater cycles of concentration, and the need for compatibility with other water treatment chemicals. As a result, users are increasingly selecting more advanced, multifunctional products that can minimize corrosion and extend equipment lifetimes in such challenging environments.

## Environmental concerns influencing trends

A further concern affecting the industry is the environmental impact of corrosion inhibitors, particularly in wastewater. End users are continuing to shift toward less toxic products that do not contain metals and can be discharged without causing eutrophication, aquatic toxicity, or other harmful effects on the environment. Similarly, corrosion inhibitors used as product additives are increasingly required to provide higher performance, allowing for longer product lifetimes while reducing volatile organic compound (VOC) emissions and other negative impacts on human health and the environment.

## Organic inhibitors largest product segment

Because of the greater challenges placed on corrosion inhibitors, water treatment companies and other suppliers

will continue having success with higher value products that integrate multifunctional additives and protect equipment in challenging operating conditions. As a result of these trends, organic inhibitors are the largest product segment in the industry and will continue to grow at the fastest pace in volume terms, gaining market share at the expense of other product types. Organic inhibitors are often less toxic than corrosion inhibitors that contain metals, and frequently of lesser concern when discharged in wastewater. The use of higher value organic inhibitors is central to many high performance water treatment chemical programs and product additive packages.

## Oil price fluctuations drive growth

The oil and gas industry became one of the largest markets for the industry's products prior to the collapse of oil prices in 2014 and 2015, and as oil prices eventually recover, this market will again see above average growth relative to its 2015 base.

## Study coverage

This study analyzes US demand for corrosion inhibitors. It presents historical demand data (2005, 2010 and 2015) plus forecasts (2020 and 2025) by application (process and product additives, water treatment), market (e.g., utilities, petroleum refining, chemicals, pulp and paper, metals, oil and gas production, other) and product (organics, molybdates, nitrites, phosphates, phosphonates, silicates, other). The study also assesses key market environment factors, examines industry structure, evaluates company market share and profiles 37 US industry players such as Ashland, Chemtura, Ecolab, GE and Lubrizol.

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### Molybdates

Demand for molybdates is expected to grow through 2020 to \$1.2 billion, providing most of the growth in the market. These advances are expected to drive molybdate demand. Molybdates have been an important corrosion inhibitor historically, especially in closed-loop water treatment systems. However, environmental concerns and high prices throughout most of the past decade have resulted in the development of alternatives to molybdate corrosion inhibitors, which has constrained volume demand. Molybdenum prices decreased substantially in 2014 and 2015 and are expected to remain low through high historical levels during the forecast period, which will present some opportunities for molybdates to regain market share going forward.

Pricing has been a key restraining factor to molybdate market growth, especially between 2005 and 2015. China, the world's largest producer of molybdenum, restricted exports in order to satisfy domestic demand in the fast growing construction and steel industries. Since molybdenum is the key raw material in the molybdate corrosion inhibitor production chain, prices of molybdates skyrocketed, rising from a low of \$2 per pound in prior to 2005 to a high of \$10 per pound in 2007. This added cost, along with growing environmental and health concerns, led to a significant decline in product volume. While prices have since declined, they remain high relative to product performance when compared to available alternatives.

Molybdate chemicals, in particular sodium molybdate, act as corrosion inhibitors, preventing corrosion through the chemical's ability to be absorbed by a metal surface, filling gaps and promoting the formation of an adherent oxide layer. Corrosion of the underlying substrate is then prevented as it becomes passivated. Sodium molybdate is largely used in a variety of cooling and boiler water treatments for its ability to prevent

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TABLE III-12

### UTILITIES MARKET FOR CORROSION INHIBITORS BY PRODUCT & SECTOR (million dollars)

Item	2005	2010	2015	2020	2025
Total Utility Water Usage (tril gal)					
lb corrosion inhibitor/mil gal water					
Corrosion Inhibitor Demand (mil lb)					
\$/lb					
Corrosion Inhibitor Demand					
By Sector:					
Municipal Water Treatment					
Power Generation & Other					
By Type:					
Phosphates					
Organics					
Molybdates					
Silicates					
Other					

Source: The Freedonia Group

TABLE IV-6

### MOLYBDATE CORROSION INHIBITOR DEMAND (million dollars)

Item	2005	2010	2015	2020	2025
Total Corrosion Inhibitor Demand (mil lb)					
% molybdate					
Molybdate Corrosion Inhibitors (mil lb)					
\$/lb					
Molybdate Corrosion Inhibitor Demand					
Utilities					
Metals					
Chemicals					
Petroleum Refining					
Pulp & Paper					
Other					

Source: The Freedonia Group

## This study can help you:

- Determine your market & sales potential
- Learn more about industry competitors
- Assess new products & technologies
- Identify firms to merge with or acquire
- Complement your research & planning
- Gather data for presentations
- Confirm your own internal data
- Make better business decisions

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## Related Studies

### World Lubricants

World demand for lubricants will rise 2.0 percent annually to 45.4 million metric tons in 2019. Growth will be supported by increasing demand for engine oils in new motor vehicles, but will be tempered by longer drain intervals that slow the engine oil aftermarket. The Asia/Pacific market will grow the fastest. This study analyzes the 41.1 million metric ton world lubricant industry, with forecasts for 2019 and 2024 by formulation, product and market for six world regions and 23 major countries. The study also evaluates company market share and profiles industry players.  
#3364..... December 2015 ..... \$6500

### Oilfield Chemicals

US demand for oilfield chemicals will rise 5.8 percent annually to \$10.3 billion in 2019. Stimulation chemicals and drilling fluid additives will remain the largest and fastest growing types, but will slow considerably from the rapid pace of the 2009-2014 period. Key trends include a shift toward slickwater fracturing fluids and high-performance drilling muds. This study analyzes the \$7.8 billion US oilfield chemical industry, with forecasts for 2019 and 2024 by type, application and material. The study also evaluates company market share and profiles industry players.  
#3352..... November 2015 ..... \$5300

### Paint & Coatings

US demand for paint and coatings is forecast to grow 3.8 percent annually to 1.4 billion gallons in 2019. Architecture will remain the largest market and grow the fastest. Water-based formulations will remain dominant and continue to gain market share. New technologies such as nanostructured coatings will drive future growth. This study analyzes the 1.2 billion gallon US paint and coatings industry, with forecasts for 2019 and 2024 by market, formulation and substrate. The study also evaluates company market share and profiles industry players.  
#3317..... August 2015 ..... \$5300

### Water Treatment Chemicals

Demand for water treatment chemicals in the US is forecast to rise 3.2 percent per year to \$7.5 billion in 2019, with volume reaching 15.5 billion pounds. Foam control agents and coagulants and flocculants will be the fastest growing water treatment chemicals. Energy and manufacturing will be the fastest growing markets. This study analyzes the \$6.4 billion US water treatment chemical industry, with forecasts for 2019 and 2024 by product, application and market. The study also evaluates company market share and profiles industry players.  
#3322..... July 2015 ..... \$5300

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## Freedonia's methods

- Establishing consistent economic & market forecasts
- Using input/output ratios, flow charts & other economic methods to quantify data
- Employing in-house analysts who meet stringent quality standards
- Interviewing key industry participants, experts & end users
- Researching a proprietary database that includes trade publications, government reports & corporate literature

## About The Freedonia Group

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