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Corrosion Inhibitors

US Industry Study with Forecasts for **2017 & 2022**

Study #2994 | March 2013 | \$5100 | 207 pages

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Growth in US demand will be driven by higher oil and natural gas output, particularly from shale formations, as well as by increasing chemical production and an expanding economy.

US demand to rise 4.1% annually through 2017

US demand for corrosion inhibitors is forecast to rise 4.1 percent per year to \$2.5 billion in 2017, with volume demand approaching 1.7 billion pounds. Growth will be driven by higher oil and natural gas output, particularly from shale formations, as well as by increasing chemical production and an expanding economy. Additionally, robust increases in construction spending will support demand for corrosion inhibitors used in cement and concrete, industrial coatings, and metal applications. The industry will continue to invest in the development of new, less costly products such as organic corrosion inhibitors with better environmental profiles and improved performance.

Oil and gas industry to drive increases in demand

The oil and gas industry's continued expansion of horizontal drilling and hydrofracturing well stimulation in shale formations will drive increases in corrosion inhibitor demand going forward, especially organic inhibitors. Increasingly caustic water produced by existing oil wells will support higher organic inhibitor usage rates, as will efforts to reuse and recycle water to avoid additional fresh-water use. The availability of relatively cheap natural gas will spur faster growth in chemical production, leading to advances in corrosion inhibitor demand in both water treatment and process additive applications. This will benefit not

US Corrosion Inhibitor Demand (\$2.5 billion, 2017)



Petroleum Refining	26%
Oil & Gas Production	19%
Utilities	16%
Chemicals	15%
Other Markets	24%

photo courtesy of corporate press office

only organic inhibitors used as process and product additives, but also more traditional water treatment corrosion inhibitors such as nitrites, phosphates, and even molybdates.

The fastest growth in corrosion inhibitor demand, albeit from a small base, will occur in concrete and cement additives due to a rebound in construction spending. Nitrites will benefit due to their popularity for protecting metal rebar in reinforced concrete. Higher construction spending will also support demand for corrosion inhibitors in industrial coatings, particularly as improvements in state and local finances allow for greater spending on infrastructure maintenance and modernization. In a number of more

mature markets such as petroleum refining, metals, utilities, and pulp and paper, moderate growth will be supported by an expanding economy. Water treatment corrosion inhibitors account for the greatest share of demand in these markets, though in most cases process and product corrosion inhibitor demand will rise at a faster pace. Organic inhibitors will be the primary beneficiaries as companies look to develop new products that offer more protection at lower treat rates, and that are more cost effective than existing alternatives. Replacing molybdates, where possible, will remain a top priority as molybdate prices remain comparatively high and some concerns about their environmental impact have arisen.

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Sample Text, Table & Chart

APPLICATIONS & MARKETS

Process & Product Additives

Demand for corrosion inhibitors used in process and protective applications is expected to grow at a rate of 1.5 percent per year through 2022, reaching \$1.5 billion in 2017. Organic corrosion inhibitors will remain the largest category, accounting for 55 percent of total demand. Inorganic corrosion inhibitors are expected to grow at a rate of 1.5 percent per year through 2022, reaching \$1.5 billion in 2017. Strong growth is expected in the process and product additives market, particularly in the manufacturing sector. Demand for corrosion inhibitors will be supported by an improving economy and a recovery in manufacturing spending. The use of relatively clean energy sources, such as natural gas, will also drive demand for corrosion inhibitors. In addition, growth in the oil and gas industry will spur gains for corrosion inhibitors in drilling and hydrofracturing fluids, particularly as shale formations continue to be developed. Chemical additives used in paints and coatings will benefit from the rebound of the US economy due to growth in construction, transportation, and manufacturing.

Product additive applications encompass diverse markets ranging from petroleum refining, where they are used not only in the refining process, but also in products such as lubricants and fuels, to cement and concrete, where they are used to prevent the rebar in many structures from degrading. Additionally, corrosion inhibitors can be a part of a protective system such as in the case of volatile corrosion inhibitor (VCI) packaging. Corrosion inhibitors used as product additives extend the useful lifetime of many components such as radiators where corrosion inhibitors are added to heat transfer fluids. Corrosion inhibitors can contribute value-added benefits to such products as metalworking fluids where their use contributes to benefits that include heat or workability and the reduction of foaming.

VCI -- also called vapor phase inhibitors (VPIs) -- can be organic or inorganic materials such as aromatic and aliphatic amines, chromates, borates, zinc salts, polyphosphates, azoles, toluene diisocyanates, or phosphonates that protect metals against corrosion.

44

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SAMPLE
TEXT

TABLE III-2

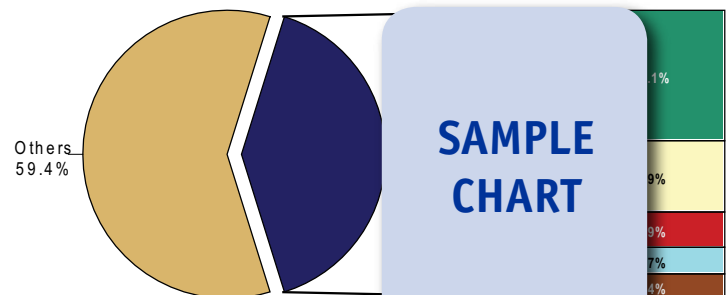
WATER TREATMENT CORROSION INHIBITOR DEMAND BY PRODUCT (million dollars)

Item	2002	2007	2012	2017	2022
Water Use* (tril gallons)					
lb water treatment/mil gallons water					
Water Treat Corrosion Inhibitors (mil \$/lb)					
Water Treatment Corrosion Inhibitors					
Molybdates					
Phosphates					
Nitrites					
Phosphonates					
Organics					
Silicates					
Other					
% water treatment Corrosion Inhibitor Demand					

SAMPLE
TABLE

CHART V-1

CORROSION INHIBITOR MARKET SHARE (\$2.0 billion, 2012)

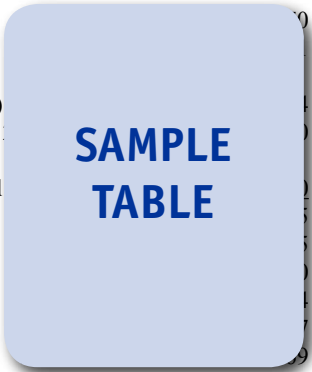


SAMPLE
CHART

Sample Profile, Table & Forecast

TABLE IV-3
MOLYBDATE CORROSION INHIBITOR DEMAND
 (million dollars)

Item	2002	2007	2012	2017	2022
Corrosion Inhibitor Demand (mil lb)1 % molybdate					
Molybdate Corrosion Inhibitors (mil lb) \$/lb					
Molybdate Corrosion Inhibitor Demand					
Utilities					
Metals					
Chemicals					
Petroleum Refining					
Pulp & Paper					
Other					



COMPANY PROFILES

King Industries Incorporated
 1 Science Road
 Norwalk, CT 06852
 203-866-5551
 http://www.kingindustries.com

Annual Sales: \$100 million (2012)
 Employees: 100

Key Products: Corrosion inhibitors and coatings

King Industries is a manufacturer and marketer of more specialty products for paint and coatings, rubber, and specialty products. The privately held company conducts manufacturing operations at its headquarters complex in Norwalk, Connecticut. In addition, the Company maintains a regional sales offices in the Netherlands and China.

The Company offers corrosion inhibitors for the lubricants and paint and coatings markets. Among King Industries' products for the lubricants market are rust inhibitors sold under the NA-SUL and K-CORR tradenames. These additives have applications in industrial lubricants, greases, gear oils, metalworking fluids, and related products. NA-SUL products are based on dinonylnaphthalene sulfonic acid, a synthetic sulfonate, and are used to protect both ferrous and nonferrous metals. Suitable for use in combination with other corrosion inhibitors, NA-SUL rust inhibitors impart such benefits as oxidation stability, filterability, and demulsability. K-CORR rust and corrosion inhibitors are based on amino acid derivatives and are used in both ashless and calcium salt containing industrial lubricants. Among the benefits of K-CORR additives are hydrolytic stability, thermal stability, and synergy with other additives.

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"Demand for molybdates is projected to rise 2.2 percent per year to \$430 million, with volume demand staying at 55 million pounds in 2017. Molybdates have been an important corrosion inhibitor historically, especially in closed-loop water treatment systems. However, environmental concerns and a recent spike in prices have spurred the development of molybdate replacements and thus demand in volume terms will continue to be weak. However ..."
 --Section IV, pg. 113

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OTHER STUDIES

World Well Stimulation Materials

World demand for well stimulation materials will grow more than 12 percent per year to over 65 million metric tons in 2017, valued at \$23 billion. Both proppants and chemicals will grow at similar annual rates. The US will remain the dominant market while demand in Canada, China, Russia and other countries will grow at a faster pace. This study analyzes the 36.8 million metric ton world well stimulation material industry, with forecasts for 2017 and 2022 by type, country and world region. The study also evaluates company market share, and profiles industry players.

#3080December 2013 \$6300

Lubricant Additives

US demand for lubricant additives is forecast to increase 4.3 percent annually to nearly \$3.9 billion in 2017. Deposit control additives will remain the largest product segment. Friction modifiers and antioxidants will be the fastest growing additives as rising treat rates offset weak demand for automotive lubricants. This study analyzes the US lubricant additives industry. It presents historical demand data (2002, 2007, 2012) and forecasts for 2017 and 2022 by type and market. The study also evaluates company market share and profiles industry players.

#3020April 2013 \$4900

World Catalysts

World demand for catalysts will rise 5.8 percent per year to \$19.5 billion in 2016. Rapid growth will occur in both Asia and the Middle East. Brazil will lead strong growth in Central and South America. Polymerization catalysts will experience the fastest growth, driven by healthy expansion of polymer resin production. This study analyzes the \$14.7 billion world catalyst industry, with forecasts for 2016 and 2021 by material, type, market, world region and for 24 countries. The study also evaluates company market share and profiles industry players.

#2989February 2013 \$6400

World Fuel Additives

The world fuel additives market will rise 8.0 percent yearly to \$59.4 billion in 2016. The rapidly growing fuel market in China will drive gains, especially as China's fuel standards become stricter and additive treat rates rise. Deposit control additives will see the greatest gains globally, while cold flow improvers grow at the fastest rate. This study analyzes the \$40.5 billion world specialty fuel additives industry, with forecasts for 2016 and 2021 by product, application, world region and for 19 countries. The study also evaluates company market share and profiles industry players.

#2977December 2012 \$6100

World Oilfield Chemicals

World demand for oilfield chemicals is expected to increase 8.9 percent annually to \$28 billion in 2016. The US will remain the largest market based on its many mature wells and rapid growth in horizontal drilling and hydraulic fracturing. Brazil will be the fastest growing market. Drilling fluids and completion and workover fluids will lead gains. This study analyzes the \$18 billion world oilfield chemical industry, with forecasts for 2016 and 2021 by product, world region and for 44 countries. The study also evaluates company market share and profiles industry participants.

#2973December 2012 \$6200

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