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Metal Shield™ FAQ

What is MetalShield™?

MetalShield™ comes from a family of products known as PetroLuxus™ and were developed over past fifteen years of study and trial. The products are proprietary in nature and were developed to liberate hydrocarbons from a variety of materials and media. All PetroLuxus™ products share basic and inherent characteristics to act with hydrocarbons on a molecular level and cause them to lose their attraction to water, metals, minerals, and other particulate matter.

MetalShield™ is a corrosion inhibiting solution engineered to molecularly bond to metal creating a corrosion resistant barrier. Due to the severe problems that arise from corrosion in the refining process, the corrosive nature of salt fouls, H₂S and other corrosives deteriorates metals and plugs equipment contaminating the refining process.

MetalShield™ is a highly concentrated product with an elevated pH. When introduced to metal, it molecularly exchanges atoms with the metal forming a bond, not a coating on the metal resistant to the formation of corrosion. MetalShield™ will interact with H₂S that is present to cause the H₂S to breakdown into water and sodium sulphide, also caustic, thus dramatically reducing corrosion. Further, in the presence of acids, the high pH of MetalShield™ will act as a buffering agent to raise the relative pH and reduce corrosion. This action combined with the presence of silicon in MetalShield™ will deposit a protective coating that bonds to the surface of metal components.

(Appendix A: MetalShield™ WC Product Data Sheet)

Is MetalShield™ Environmentally-Friendly?

Yes, MetalShield™ is an inorganic compound and thus contains no organic compounds, toxic metals, or their salts. The environmental fate of MetalShield™ is silica, the same material as found in beach sand. The chemistries of MetalShield™ pose no threat of persistence in the environment, no bio-accumulation, nor toxicity when used at the recommended concentrations and carries an NSF/ANSI 60 Certified liquid cleaning solution and meets the regulatory requirements for the USA, Canada, Israel, Saudi Arabia, Spain and the UAE..

Can MetalShield™ be used around Potable Water?

Yes, MetalShield™ is NSF/ANSI Standard 60 certified. NSF/ANSI (American National Standards Institute) Standard 60: Drinking Water Treatment Chemicals – Health Effects by governmental agencies that regulate drinking water supplies. Developed by a team of scientists, industry experts and key industry stakeholders, NSF/ANSI Standard 60 sets health effects criteria from many water treatment chemicals including:

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- Corrosion and scale inhibitors
- Coagulants and flocculants
- Disinfection and oxidation chemical
- pH adjustment, softening, precipitation and sequestering chemicals
- Well Drilling aids
- All other specialty chemicals used in drinking water treatments

For additional information on NSF/ANSI Standard 60, please visit: <http://www.nsf.org/services/by-industry/water-wastewater/water-treatment-chemicals/nsf-ansi-standard-60/>

(NSF/ANSI Standard 60: Certificate # **CO142260-01**) (Note: this is currently being updated)

Is MetalShield™ harmful to humans?

MetalShield™ is shipped in its concentrated form. It has a very high pH – 12.5+. Although the pH is high, it is highly buffered in its concentrated form, though if it is spilled on skin it will not harm. But follow the safety handling instructions as specified in the MSDS.

(Appendix C: MetalShield™ Material Safety Data Sheet)

How is MetalShield™ designed to perform?

MetalShield™ was designed as a multipurpose treatment formulation for coating metal surfaces for the reduction or elimination of corrosion. The advantages of MetalShield™ are simply. These advantages include:

- Anti-Microbial
- Anti-Corrosion properties
- Molecularly Bonds to Metal
- H2S Mitigation
- Produces no toxic byproducts
- Safe to handle
- Does not produce toxic gases



How many different chemicals does it replace?

Depending on the operation and the current chemicals be used, ChloroLuxus™ WC and replace between 4-8 different chemicals. This cost benefit makes ChloroLuxus™ WC an exceptional value proposition and greatly mitigates the potential of human error while mixing chemicals.

Where can MetalShield™ be applied?

MetalShield™ can be applied directly to any metal surface with an ordinary paint brush, garden sprayer or paint sprayer apparatus in dry conditions. Once dry, it forms a bond to metal to resist corrosion and rust.

Is MetalShield™ a biocide?

NO! Biocides work on the mechanism of poisoning bacteria. Biocides such as chlorine work by poisoning the bacteria, although some stronger bacteria species have a survival mechanism whereby they move back into their protein protective shell. This allows the bacteria to survive the poisoning.

Environmentally-friendly MetalShield™ works on the mechanism of destabilizing the homeostasis - The ability or tendency of an organism or a cell to maintain internal equilibrium by adjusting its physiological processes. MetalShield™ chemistry disrupts the bacteria's ability thrive through a "coating" mechanism with coats the bacteria and/or the food source for the bacteria. This mechanism does not allow the bacteria to survive or thrive.

(Appendix D1 & D2: Sangre de Cristo Laboratory Results – Please review Lab notes)

Is MetalShield™ a surfactant?

No. It has surfactant like qualities in that it readily reduces surface tension that allows oil to release from other materials. The mechanism involved is disruption to weak hydrogen bonding of oil to surfaces. MetalShield™ is derived from inorganic materials; surfactants are typically made from organic materials which possess entirely different chemical properties.

How is MetalShield™ a corrosion inhibitor?

When MetalShield™ comes into contact with metal surfaces a polymer layer of silicon and oxygen are deposited. The polymer creates in effect, a barrier that prevents the metal surface from interacting with the chemistry of the water stream. It is resistant to acids, alkali and organic compounds.

Water well components: pumps, casing, tubulars, screens, etc., pipelines and storage tanks receive the above mentioned coating barrier which extends the life of the components and equipment.

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(Appendix F: Corrosion Inhibitor Photos)

Will MetalShield™ harm my equipment?

No. in fact, ChloroLuxus™ will improve metal production components by cleaning and leaving a layer of protection to reduce further problems.

How long does a MetalShield™ treatment last?

This has not been firmly established yet. For example one of the earliest wells treated with MetalShield™ brand product was for the US Department of the Interior's Bureau of Reclamation in Colorado. On average the life of a well there is 12-18 months due to the high concentration of bacteria. This well was treated in the summer of 2011.

How is MetalShield™ shipped?

MetalShield™ is shipped in various size containers.

275 gallon IBC Totes (Actual 250 gallons)

55 gallon drum (Actual 50 gallons)

5 gallon pail

Are any hazardous placards required for transport?

MetalShield™ is an environmentally-friendly product that is certified to NSF/ANSI Standard 60 – Chemicals used for the treatment of potable water. It is non-toxic, non-flammable and non-hazardous. There are no DOT restriction in the United States thus no Hazardous placards are required for transport.