



NEWS ALERT !

VBCI Series - A class of environmentally friendly corrosion inhibitors for a cleaner, greener, better tomorrow.

30th May 2019

Vappro PECIs

Non-Toxic Plant Extract Corrosion Inhibitors

Vappro-PECIs will be made commercially available in December 2019.



***Another Environmentally Friendly Innovation
Made Available by Magna International Pte Ltd***



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Vapropro PECIs

Non-Toxic Plant Extract Corrosion Inhibitors



Introduction

Corrosion is a ubiquitous phenomenon that takes place in every industry. The costs of corrosion are tremendous and amounts to 4.0% of gross domestic product (GDP) in USA. Corrosion control of metals is of technical, economical, and environmental importance. The environmental toxicity of corrosion inhibitors has been a great concern as such, is increasingly being curtailed by recent environmental restrictions. In many parts of the world, high levels of inorganic phosphates are also restricted by law. In response to these environmental guidelines, Magna International has developed a range of non-toxic, environmentally-safe corrosion inhibitors derived from plants marketed under trade name **Vapropro-PECIs**.

There is a marked increase in demand for plant based organic corrosion inhibitors over the last 2 years, as it becoming gaining popularity in metal industry because of their effectiveness at wide range of temperatures, compatibility with protected materials, good solubility in water, low costs and relatively low toxicity.

Vapropro-PECIs plant based organic corrosion inhibitors adsorb on the surface to form protective film which displace water and protect it against deteriorating. Effective organic corrosion inhibitors contain nitrogen, oxygen, sulfur and phosphorus with lone electron pairs as well can contain structural moieties with π -electrons that interact with metal favoring the adsorption process.

Due to the increasing industrial applications of aqueous acid solutions, **Vapropro- PECIs** were developed to combat corrosion of low-carbon steel especially in acid media. The most important fields of application are acid pickling, industrial cleaning, acid descaling and in the petrochemical processes. As acidic solutions are among the most corrosive media, PECIs organic corrosion inhibitors are used to decrease the corrosion rate of low-carbon steels.

The main characteristic of **PECIs** organic corrosion inhibitors is their ability to adsorb onto metal surfaces. **PECIs** are mixed corrosion inhibitors because they adsorb at cathodic as well as anodic sites, providing corrosion inhibition for both reactions: the reduction of oxygen or protons at cathodic sites and the metal oxidation at anodic sites.



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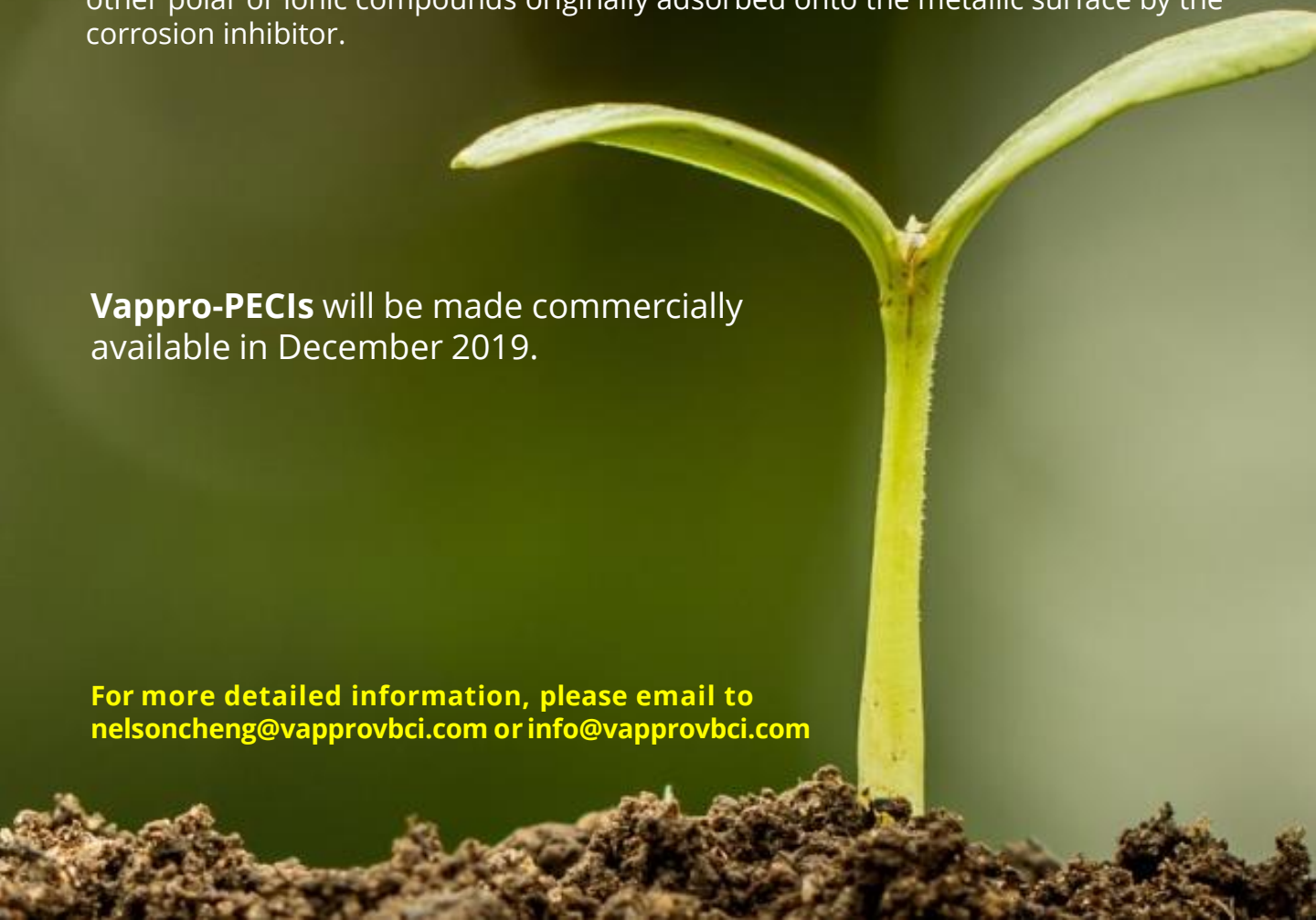
Mechanism of PECIs

Vapro-PECIs organic compounds containing mainly nitrogen, oxygen and sulfur, with or without Heterocyclic.

The mechanism corrosion inhibition of **PECIs** is achieved by modifying the activation energy of the cathodic and/or anodic reactions occurring at the electrode surface, or by decreasing the available reaction area via a geometric blocking effect. In general, the active site in the organic molecule responsible for the adsorption process is a polar group and therefore the presence of heteroatoms in the chemical structure is fundamental for a corrosion inhibitor. As is well-known, the first step in adsorption, when the thermodynamic equilibrium is favorable, is the replacement of water or other polar or ionic compounds originally adsorbed onto the metallic surface by the corrosion inhibitor.

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For more detailed information, please email to nelsoncheng@vapprovbc.com or info@vapprovbc.com





www.vapprovbci.com
Environmentally Friendly VBCI Solutions



Magna International Pte Ltd

10H, Enterprise Road, Singapore 629834.

Tel (65) 6788-1228

Fax (65) 6785-1497

Email into@vapprovbci.com

Web www.vapprovbci.com



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