

African

Mining Brief

May - June 2018, Volume 13 No.3

Africa's Leading Mining Journal

Boosting aging power plants

As the continent is engrossed in the euphoria of renewable power generation, it would be remiss for power utilities to neglect the urgency of retrofitting old power plants.

Inside

- Locomotive leasing: Gaining traction
- Life-saving messages delivered instantly through metal

VCI power

Volatile Corrosion Inhibitors (VCIs), sometimes referred to as vapor corrosion inhibitors, packaging has been endorsed globally as an effective alternative to conventional method of corrosion and rust protection of valuable, but vulnerable metal parts.



When it comes to corrosion protection for metal parts that are to be stored or transported, the first thing that springs to mind is the conventional approach of corrosion protection like using wax or oil. Nonetheless, the limitations of these methods have been extensively chronicled. For instance, with traditional methods, metal parts are often dipped in petroleum-based rust preventatives that require cleaning and proper disposal before use of the part. In addition, these methods fall short when exposed to extreme humid conditions.

Volatile Corrosion Inhibitors (VCIs), sometimes referred to as vapor corrosion inhibitors) packaging has been endorsed globally as an effective alternative to conventional method of corrosion and rust protection of valuable, but vulnerable metal parts.

A compound of environmentally friendly corrosion inhibitor chemicals, VCI are introduced into plastic bags or film, and paper at the point of manufacture. VCIs ensure that the parts are in pristine condition, protected from extreme environmental conditions and humidity changes better.

The magnitude of the problem

To appreciate the relevance of VCI packaging better, one has to look at the magnitude of the problem of corrosion in industries. Relating to the subject, US-based Green Packaging Inc. makes interesting observations regarding corrosion: it is only through understanding how corrosion occurs that companies can seek effective solutions on how to control it.

The following are the observations that the company has made about corrosion:

- The corrosion reaction between metals and oxygen is immediate and continuous unless the corrosion cell perpetuating the reaction is stopped
- Corrosion on metal is a result of oxidation – a molecular, destructive reaction between oxygen and a metal's surface
- While some would argue that oxidation does not weaken metal, its surface

disintegrates, a brittle film forms. However, rust does weaken metal and is a serious concern.

The suitability of VCI

VCI packaging creates an invisible molecular layer of corrosion protection on metal surface, according to Green Packaging's explanation. Routinely, the corrosion-inhibiting compound migrates from the VCI packaging – this could be paper, poly bag and foam emitter – into the packaging environment, while a thin layer of protection adheres to metal surfaces, reaching into recessed areas, hooks, nooks and crannies.

VCI packaging adjusts to the temperature and humidity for efficient protection. Also, vapours replenish inside the contained package. Then, the inhibitor forms a barrier between the metal surface and moisture in the atmosphere, thereby preventing corrosion.

Case in point

A case in point of how packaging materials protect metal goods from corrosion include is Cortec Corporation's Vapor phase Corrosion Inhibiting (VpCI) Technology, which is used to safeguard metal components during shipment, when extreme humidity changes can put metals at risk for corrosion. Typically, VpCI molecules incorporated into a packaging material work by evaporating into the air and forming a protective molecular layer on all metal surfaces inside an enclosed package. When the component reaches its destination, it can be unwrapped and used immediately without additional cleaning or degreasing.

Massive benefits

VCI offer massive benefits compared with traditional corrosion protection methods. The main ones are reduced downtime, environmentally friendly, and improved protection of metal components.

No downtime due to part wear

With VCI equipment does not experience

downtime as a result of wear of parts due to corrosion, which can translate into loss of potential revenue.

If it is coatings that are used in corrosion protection, there is additional cost in terms of surface preparation and coating reapplication.

Environmentally friendly

VCIs are a recyclable alternative to polyethylene and waxed papers. They are non-toxic, fully repulpable and recyclable.

Different specifications for different sizes

All in all, it is important for companies to make informed choices when selecting VCIs for their respective requirements. Naturally, one cannot use the same specification for different metal parts. The rule of the thumb is that, since metal parts are manufactured in different sizes, weights and shapes, they require different corrosion-inhibiting packaging solutions.