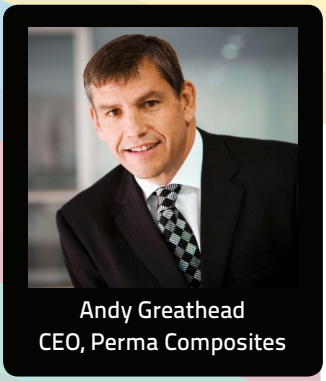
A Perma Composites Whitepaper

7 March 2014

Perma composites

• Industrial • Marine • Timber • Experts



Andy Greathead
CEO, Perma Composites

Fightback against corrosion

According to Curtin University's references from the World Corrosion Organisation White Paper, the cost of corrosion is approximately $30 Billion per year.[1] It is also estimated that the mining industry sector alone could achieve savings of $3 Billion per year by using the latest products, knowledge and technology to combat some of the most common causes of corrosion.[2]

Prevention is indeed better (and much less expensive) than the cure, with pre planning and well considered designs, the problems caused by corrosion can be reduced in severity or even better still, eliminated.

Perhaps the most important of all factors is the material selection. There exists a large range of high alloy steels which will positively reduce the onset of corrosion, but unfortunately these materials are generally also much higher in price therefore making project costs and capital expenditures rise to unaffordable levels and possibly render a project unviable.

Other considerations which can be evaluated, in addition to the raw material selection itself include; internal & external coatings, protective additions such as cladding and the use of cathodic protection - are all expensive and time consuming processes.

Further corrosion inhibition can also be achieved with the use of corrosion inhibiting chemicals either inorganic such as nitrates, or organic like imidazolines - and a number of other like-type formulas.

The damaging effects of corrosion

Here in lies a composite solution. Fibre-reinforced plastics or commonly referred to as FRP, is a composite product technology that's potentially the most convenient and cost effective solution to avoid the issues of corrosion. FRP composites do not corrode, have now been around for some time and can be designed and developed to replace most structures that utilise conventional materials such as steel or concrete.

As the composite experts, Perma Composites have developed a wide range of different resin types, designed to suit varying levels of corrosion risk. Using its exclusive PermaStruct range of composites, Perma can offer vinyl ester, isophthalic, phenolic and orthophthalic resins in its products - all designed to meet various levels of corrosion and fire resistivity requirements.

In addition to being capable of providing chemical resistance, PermaStruct FRP products are also designed to withstand high structural loads making them an ideal solution for all types of infrastructure projects such as bridges / walkways / treatment plants / mining, construction and marina projects.

PermaStruct FRP products also perform exceptionally well when faced with continued exposure to wet or damp conditions, acidic or salty and marine environments.

One of the seldom known facts of composites is how they typically can provide a longer life expectancy of that of steel, concrete and timber. By selecting the most appropriate resin type, a project engineer can avoid corrosion related issues for the life time of a project – a factor which will help achieve the $3 Billion per year in savings mentioned earlier. Industry sectors best suited to the use of composite product technology are wide and varied, including; mining, construction, water treatment, marine, processing plants, and power generation. Another benefit of composites is their inertness (not being conductive) - ideal in the electrical industry.

Whilst being the enemy of corrosion, composites are also lighter than steel making them safer to use, easier and quicker to install - offering a low maintenance alternative to traditional materials delivering even greater cost savings and project benefits.

Proven projects and an increasing number of applications will continue to result in an even greater take up of composite products throughout industry. Make sure you don't incur unnecessary expense and problems. If you require any additional information, please contact myself or the Perma team for help and support and find out how we can eliminate, or better still, prevent your corrosion problems.

[1]Source quoted here: http://courses.curtin.edu.au/course_overview/postgraduate/corrosion-eng

[2]Source quoted here: http://corrosion.curtin.edu.au/research/mining.cfm

1300 366 938
permacomposites.com
info@permacomposites.com