

CORROSION FACTS AND FIGURES SUMMARY

There are so many facts and figures relating to the costs of corrosion that it can easily become confusing so, for the purposes of illustration, we will take some headline figures and draw a thread to see how Alocit and Enviropeel fit in.

Despite the age of the data, the most commonly quoted figures on the overall cost for corrosion in the US were calculated by CC Technologies of Dublin, Ohio and NACE for the Federal Highway Administration Office of Infrastructure Research and Development in 2002, mainly using data from 1998. This showed an overall cost of \$276 billion, a figure which was extrapolated from detailed analysis of a number of key sectors: Infrastructure, Utilities, Government, Transportation, Manufacturing and Production. Annual expenditure on corrosion control methods and services in 1998 was \$121 billion with \$16.56 billion spent on organic coatings and \$1.1 billion on corrosion inhibitors.

For Infrastructure, which included highway bridges, railroads, airports, hazardous materials storage, waterways and ports, gas and liquid transmission pipelines, the overall cost was \$22.6 billion. In these figures the costs for highway bridges alone amounted to \$8.3 billion, which was split between replacement (\$3.8 billion), concrete bridge deck maintenance (\$2 billion), concrete sub-structure maintenance and capital (\$2 billion) and maintenance painting (\$0.5 billion).

When it comes to concrete protection, Alocit has a track record of more than three decades of success. While unprotected structures around the world are struggling to achieve the increased lifespans demanded by modern cost controls, concrete structures coated with Alocit in highly corrosive environments show no sign of failure, with coatings remaining intact for more than 30 years. On steel too, Alocit has a worldwide reputation for providing coating solutions that work in the most difficult areas, allowing owners and operators to restore ageing infrastructure and protect new installations.

No other product has Alocit's ability to be applied to green concrete, resist hydrostatic pressure and adhere to wet or oily steel and concrete surfaces – even underwater! It is an ideal tool for the reduction of infrastructure refurbishment costs, particularly those associated with poor conditions.

The introduction of Enviropeel has allowed further solutions to be offered, its combination of encapsulation and corrosion inhibition providing new opportunities for corrosion prevention, with applications worldwide on pipelines, power generation infrastructure and in the offshore industry.

So, with highway bridges, railroads, airports, hazardous materials storage, waterways and ports, gas and liquid transmission pipelines all benefitting from their protection, Alocit and Enviropeel are well placed to provide solutions for the Infrastructure sector.

Included in the Government sector is Defense. Much has been said about the cost of corrosion in the defense forces, with an overall cost in excess of \$20 billion and with individual cases which are quite staggering. For example, \$104,595,003 was spent in 1997 on corrosion control for just one aircraft type, the C5 and the average corrosion control cost between drydock cycles for each of the Navy's ships is \$3.9 million - with an annual cost of \$50 million for bilges alone.

Costs in the defense forces have been exacerbated by a number of factors, poor design, poor training and a failure to take a long-term view. New attitudes towards cost control and a post-911 focus on system readiness coupled with extended use of equipment beyond originally intended life cycles has led to radical reappraisal of anti-corrosion measures. The approval by the US Navy of Alocit 28.15 was as a direct result



of its multi-million cost-avoidance program to provide long-term solutions in areas where current practice was leading to corrosion failures within 6 months of refurbishment.

The same picture can be found in the Manufacturing and Production sector where, in the oil refining industry, for example, \$3.7 billion was spent on corrosion control with \$1.8 billion on maintenance. With over 3,200 km of pipeline on a typical refinery and in excess of 40,000 flanges on a large production site, the introduction of Enviropeel can produce enormous cost savings, both in terms of corrosion prevention and reduced downtimes. Alocit, too, has proved its performance in refineries after years of experience, with Shell for example, on cold and sweating pipelines.

As life-cycles are extended and increasing demands are placed on systems with far less built-in redundancy than in the past, a range of anti-corrosion tools are required to enable engineers to ensure safety and function. For example, in the UK and Norwegian sectors of the North Sea in 2005, about 70 offshore platforms had been in operation for more than 30 years and about 55 for 20-30 years, some well beyond their original design lifetimes and needing considerable work. Effective maintenance of offshore platforms and their equipment is paramount for safety and continuity of production but maintenance costs and challenges to success are high. Because Alocit and Enviropeel coatings are easy to use, durable and able to be applied in a range of challenging environments, they are ideally suited to provide the coating tools industry needs.

Enviropeel has produced 500% increases in equipment lifetimes for the Australian mining industry and calculations for ConocoPhillips in the UK and BP in the Caribbean have shown savings of between 30% and 70% when comparing Enviropeel with other solutions. Alocit offers savings too, with up to 30 years between applications and an ability to protect where other products struggle – in the cold, underwater, in the splash zone and on sweating pipes.



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