

# Passive fire protection and modern industrial coatings

MechChem Africa talks to Kansai Plascon protective coatings' specialist, Alvin Varaden about the latest in protective coating solutions, passive fire protection (PFP) and the modern trend towards fewer and thicker coatings designed for faster application and a longer life.

**K**ansai Plascon has been involved in delivering coating-based protection for industrial plant and building structures in South Africa since the 1970s, and has worked on many prestigious projects such as the Engen refinery in Durban and several Eskom power stations.

"We cover solutions for various segments, including oil and gas; infrastructure for shopping malls and airports; road and rail bridges; and industrial equipment such as tanks, plants, piping and their support structures," begins Varaden.

"We at Kansai Plascon have a strong presence in the mining industry, offering maintenance services for mines such as Anglo Platinum and other metal and materials processing plants, including ArcelorMittal in Saldanha Bay and to Sasol.

## Passive fire protection (PFP) coatings

Passive fire protection is critical in safety-critical steel constructions such as hospitals and shopping malls, as well as high fire risk plants such as refineries. "The legislative requirements for PFP are also growing," Varaden continues.

He cites the huge fire in the Rossburgh area of Durban – a Transnet warehouse storing containers of wax and polypropylene that caught fire in March 2017 – as an example of why these coatings are so critical.

"As well as for corrosion protection, steel structures need to be protected in case of fire to insulate the steel and provide enough time for people to escape the building before the fire takes hold and the structure collapses," he tells *MechChem Africa*.

Passive fire protection (PFP) coatings, often referred to as intumescent coatings, are designed to protect the steel integrity during a fire and solutions are designed to provide 30 to 120 minutes of fire resistance to a building's support structure.

Intumescent produce a low-density foam char, which is a poor conductor of heat so it retards heat transfer to the steel. The coating formulation also contains hydrates, which release water vapour in the presence of fire to produce a cooling effect. "So these PFP coatings first cool the surface to slow down

the fire's progress, then, once the hydrates are spent, the insulation characteristics of the char slow down the transfer of heat to the steel," Varaden explains.

"For the replacement of the Transnet warehouse building, PFP coatings became a legislative requirement, as they are for many high-risk buildings such as these," he adds.

In terms of PFP coating thicknesses, Varaden says that total layer thicknesses of between 500 and 2 000 µm are typical for cellulosic fires, with the coating generally being applied after fabrication in the shop and before erection.

The coating thickness required is governed by on two factors, the fire resistance rating required and the building's design. "A longer evacuation time together with a design based on using thinner steel sections – such modern lightweight steel frame (LSF) construction – tend to require thicker coatings, because the steel itself has a lower fire resistance so the retardation time has to be higher," he explains.

To apply PFP coatings, spray techniques are preferred. "The success of PFP is dependant on a correct and uniform layer thickness. Application using a roller or brush cannot deliver uniformity required and weak spots tend to compromise the fire protection properties. So the tendency is to spray apply the PFP coating during fabrication and then use a brush and roller for touching up areas exposed during erection," he informs *MechChem Africa*.

Kansai Plascon offers two broad types of PFP coating. "Petrochemical, offshore and LNG facilities are at risk from hydrocarbon fires and explosion accidents and they need higher temperature protection: above 1 000 °C," he says.

AlesChar Epoxy PFP is the recommended product in this environment. "In the event of a hydrocarbon fire, a relatively thick (±5 000 µm) Epoxy PFP coating is required to protect steel structures for long enough.

Also offered are PFP coatings to mitigate against cellulose fires, for coating wooden floors and doors, for example, for protection in the 250 °C to 600 °C temperatures range, with Kansai Plascon's C-Therm IC 600WB being an example used for such applications.



## Corrosion protection

"We have a market segment approach in providing corrosion protection solutions as each segment has specific requirements and approvals. The mining segment requires chemical resistance coatings where our Plascotuff 6000 performs exceptionally well, along with high abrasion resistance coatings for slurry tanks where Plascotuff 5000 is better suited. Similarly, in the oil and gas segment, approvals for petrol; diesel and jet fuel would be required," Varaden continues.

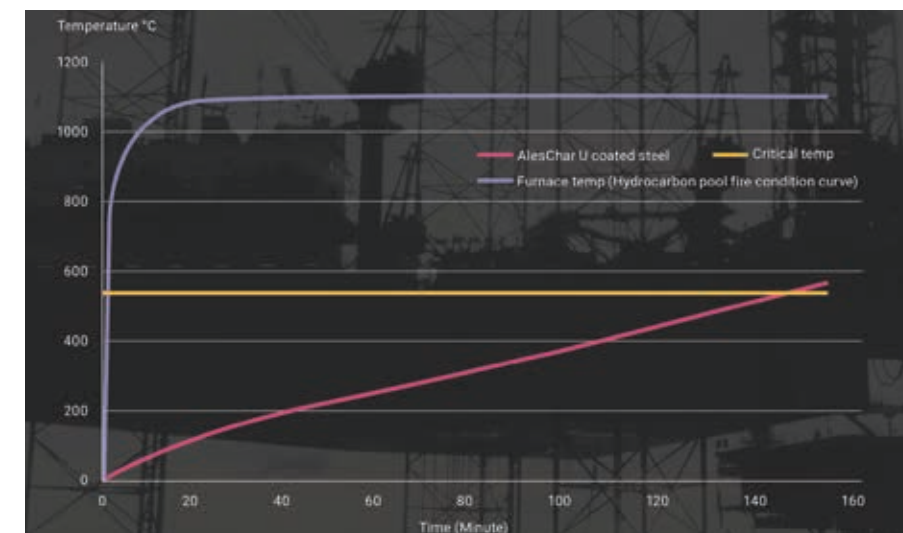
"For general corrosion protection in corrosive environments from coastal marine conditions to less corrosive environments found inland, we have a wide range of different formulations at our disposal: from zinc rich coatings to epoxy, polyurethane and vinyl," he notes.

He says that the modern trend is towards simpler systems that involve quicker drying times with fewer thick coatings. "A typical three-coat system to produce a 300 to 350 µm layer thickness can now be achieved with a single coat," Varaden informs *MechChem Africa*. "These solutions enable far quicker turnaround times and are more cost-effective than traditional paint systems," he adds.

In line with this market trend, the introduction of DTM (direct to metal) polyurethane coatings offer a single coat solution where corrosion protection and UV resistance is required, eliminating the need for a primer coat. These are fast curing coatings that allow the contractor to handle the steel just one hour

after application, which is very important for fast-track projects," he explains.

"Our coating systems are designed and tested along the ISO 12944 standard; which provides guidelines on corrosion protection coating types; thickness and life expectancy. We can offer solutions from a minimum of



**Above:** A temperature time chart showing how the intumescent in AlesChar Epoxy PFP slow down the transfer of heat to the steel.

**Left:** For petrochemical, offshore and LNG facilities at risk from high temperature hydrocarbon fires and explosion accidents, Kansai Plascon recommends AlesChar Epoxy PFP.

five to greater than 15 year life expectancy," he says.

"As with all our products, Kansai Plascon has proven its coating technology. Some of our acrylic nitrate coatings, for example, were applied to crude oil tanks back in 1979/1980 and these are still in good condition today," Varaden says.

"We strive to offer 360° solutions through our consultancy service for new or maintenance projects. We determine the original design specification together with the customer; supply the ISO-accredited quality

product; offer onsite technical support and surveillance inspections during implementation; and provide a guarantee to asset owners for peace-of-mind," he says.

Japan-based Kansai Paint develops its own formulations that are supplied internationally. The company is among the global Top 10 paint companies and, with blending and manufacturing facilities in South Africa, Kenya, Uganda, Nigeria, Zambia and Botswana, to name but a few, has the largest footprint in Africa. The local entity has a Level 4 B-BBEE rating. □

## Sassda Columbus Stainless Awards 2018: celebrating innovation

Sassda is proud to announce the official launch of its biennial stainless steel awards, which this year centres on the theme 'Celebrating Innovation'.

The awards are open to individuals and companies, locally and abroad, that are involved in the design, production, conversion, distribution and use or specification of stainless steel and entrants do not need to be a member of Sassda.

"We would like to encourage participation in what we believe is now the 'Oscars' of the stainless-steel industry and an initiative that has become synonymous with world-class products and skill," says Sassda executive director, John Tarboton. "This year's winners will also receive an 'Award Winner' logo that has been created for them to use in their marketing and company collateral, adding value to the business on a day-to-day basis," he adds.

The Stainless Steel Awards draw winners from a broad spectrum of sectors to ensure they are fully representative of the

depth and diversity of the industry, thereby generating commercial awareness and a real return on investment. "At a practical level, they also serve to strengthen the confidence and belief of industry players in both their sector and their own company culture, with employees becoming more cognisant of the pivotal role they play in underpinning the economy of a country," says Tarboton.

In 2016, the Sassda Columbus Stainless Awards recognised a record 39, world-class winners, up from the 12 awards presented in 2014, and saw an over-subscription of sponsors. The 2018 Awards promise to be as spectacular and will draw winners from an expanded number of categories, as there are now 17 for entrants to choose from.

"We've embraced a more modern approach to championing stainless steel across the continent and the awards are the perfect embodiment of this. This is evident in how we are seeing stainless steel being used in more complex ways and in a variety of formats with real, working examples of the



long-term cost benefits of stainless steel as opposed to short term savings, on cheaper alternatives such as mild steel," Tarboton concludes.

Sassda representatives will be available to visit prospective entrants' offices and assist them with completing the entry form. To set up a meeting, please telephone sassda on 011 883 0119 or email Francis Le Roux.

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