

Solid as a block: waterproofing products

by Sarah Blackman Apr 25, 2009

After years of scientific research, a new generation of waterproofing products are being introduced to the Middle East construction industry, but are they necessary for buildings surrounded by desert?

The Gulf waters – calming and clear or destructive and dangerous? Most people would think the former words would best describe the sea that surrounds the region, but when it comes to construction, this may not be the case.

It is easy to assume that buildings here do not need protection from water absorption and corrosion due to lack of rain, when in fact, this part of the world is one of the biggest markets for waterproofing products. If we dig a hole a few metres deep, especially in cities near the ocean, then we will find water and it is this fact that can put foundations and ultimately a whole structure at risk of deteriorating.

Paints, coatings and membranes have been tried and tested over the years, but many of these products are used for roofs and walls where water will simply slide off the surface – not the type of product needed to protect a building against high water pressures underground.

“Despite the fact that this a country characterised by lack of rain, buildings will face some cracking after they have been constructed,” explains Universal Paints and Chemicals factory manger Mohammad Nayef. “This will eventually lead to water leakage, especially in high rise buildings, which often have underground parking.”

Kryton is another company that specialises is waterproofing for concrete structures. It manufactures a technology called Krystol, which blends in with the material rather than coating it, and chemical a reaction takes place.

Krystol reacts with un-hydrated cement particles in the concrete to form millions of needle-like crystals. These crystals grow to fill the naturally occurring pores and voids in concrete, which according to Kryton’s vice president Kevin Yuers, permanently blocks the pathways for water.

“If new cracks form due to settling or shrinkage, incoming water triggers the crystallisation process and additional crystals begin to grow. These fill the cracks and ensure that the structure’s waterproofing barrier is maintained and protected,” he explains.

So, water pressure can cause corrosion and cracks in a building, but in addition to this, the particles that water carry, such as ferrous materials or even traces of calcium in the water, can also attack the rebar of a structure and cause it to deteriorate.

Hycrete is a company that has come up with a liquid that is designed to repel water and other contaminants that could attack the rebar.

“The Hycrete forms a long-chain hydrocarbon, which plugs all capillary pores and mechanically attaches itself to the sides to become part of the structure to prevent water from entering,” says Hycrete vice president of international sales Peter Condy “We allow less than 1% absorption into the concrete.”

To demonstrate how this works in further detail, the company recently built a concrete tank filled with 108,000 litres of water, on Yas Island in Abu Dhabi.

We put in four lifts in the tank to show Hycrete's capability even where there is a cold joint, which usually allows a massive entry of water," explains Condy. "As well as the Hycrete mix we used water-stop membranes between cold joints and re-injectable mechanisms. So in the rare occasion where there is a leak, the injectable foam will stop it."

But how does the cost of these new products compare to the traditional price of coatings? Many paints are approximately the same price of the chemicals but before paints are applied, a building material such as concrete has to be prepared, leading to more time, labour and costs.

Furthermore, the building material must be stripped of coatings before it is recycled.

"The traditional waterproofing is significantly harder to recycle. If there are paints or coatings on the concrete then you have to take that off before you crush it and that is extremely hard to do," explains Hycrete's CEO David Rosenberg.

"Also, once salt gets into to the concrete, the use for that crushed material is extremely limited because salts corrode steel reinforcement and you can't recycle it, or use it for anything structural once that happens."

According to Nayef, however, there are coatings coming into the market that can protect building materials against extreme climatic conditions. "Chemipaint produce Weather Coat, which has resistance to chemical attack and withstands high pressure as well as UV rays," he says.

So what's next for construction technology? Knowing the Middle East's ambition to be the best, something even bigger is bound to come up. But until then, we can feel safe in the knowledge that our feet are on solid ground.

HYCRETE

Hycrete is a third generation run company whose roots go back over 37 years. Throughout this time, the company has been headquartered in New Jersey. The Hycrete technology was created on a foundation of extensive technical research, over 10 years of exhaustive laboratory and field testing, and superior product performance.

The material coupled with field service delivers a system that provides waterproofing and rebar corrosion protection, thereby extending the structural and cosmetic life of concrete.

The company's offices have been based in Dubai for nine months and the company hopes to expand to Saudi Arabia before May this year. Hycrete has now set up around 160 projects all over the world and has also received a lot of Qatar and Bahrain-based companies.

The foundation of Hycrete proprietary technology goes back to the early 1950's, when one of Hycrete inventors, Michael Rhodes, developed a class of rust inhibitors. Michael Rhodes also worked closely with NASA on programmes such as the development of solid rocket fuels.

In the mid 90's, Rhodes' focus shifted back to corrosion technology development, and he invented a water-stable, environmentally safe, and soluble version of the precursor products from the 1950s. This invention has proven to be highly effective as a moisture blocker and an anti-corrosion agent within concrete.

Universal paint and chemicals

Established in Lebanon in 1979, Universal Paint and Chemicals (Chemipaint) provides paint and waterproofing products to more than a hundred agents and dealers in the region. And, in 2005, the company expanded in to the UAE to set up a new factory in Abu Dhabi Industrial Zone.

The company is the exclusive agent for Polyglass, a waterproofing product supplier based in Italy. Polyglass produces modified bitumen based water membranes. The product range offers waterproofing in new constructions and the refurbishment of industrial and non-industrial buildings.

Chemipaint's additional range of products includes architectural paints, primers and sealers, varnishes and wood preservatives. This variety includes water-based, solvent-based, and water borne enamel paint for masonry, wood and metals. Over the years, the company has also invested in new technologies and have employed technical experts.

The manufacturer also manufactures heavy duty industrial maintenance products such as polyurethane paints, thermoplastic acrylic paints, water proofing products and systems, elastomeric and cement curing compounds.

Chemipaint has acquired ISO 9001:2000 for its high quality management system and became the first paint manufacturer in Lebanon and the Middle East Region.