

## **C-2-3 New generation waterproof materials for the markets in Hong Kong**

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### **ABSTRACT**

Water seepage is a common issue in buildings of Hong Kong, and therefore waterproofing technology plays an important role to extend the service life of the buildings particularly in those areas under frequent raining like the summer in Hong Kong. In fact, even though there are already a number of prevailed products in the waterproof market over decades their performance are not necessary truly meet the expectation of users. Indeed, materials technologies have been dramatically advanced and aiming to promote the technology competitiveness of companies in the field by advanced materials we have developed two innovative waterproofing materials together with the industry partners. A novel polymer cementitious coating material has been developed which possesses ultra-high flexibility, excellent adhesion and superior waterproof performances and act as an effective binder on the concrete surfaces and is applicable even on the wet surfaces. This environmental-friendly nano-modified polymer cementitious coating consists of two components of liquid emulsion and cement powder. The nanoparticles dispersing in liquid emulsion can act as self-lubricating agent in the developed coating product in order to withstand and transfer the tensile force and to align the orientation of polymer molecular chains in the coating for better waterproof function. Therefore, the developed coating can exhibit 2 times better flexibility than that of market-available products and 1.5 times better adhesion than that of market-available products. Moreover, this coating can withstand 0.5 MPa water pressure over 72 hour with no water leakage. The VOC value of the nano-modified polymer cementitious coating is very low (<50g/L). The developed coating can be easily applied in various construction waterproofing fields and even on wet substrates, e.g. basements, toilet, terraces, swimming pools, water tanks, decks, etc. We have also developed an advanced self-adhesive bentonite-based one-step waterstopper to prevent the ingress of water through concrete and construction joints. This novel waterstop material can offer superior waterproofing (No water leakage under 0.5MPa for 72 hours in fresh water and 0.4 MPa for 72 hours in salt water, respectively). The new material is also easy to shape and form into construction joints and corners in a simplified application process. Compared with traditional rubber-based water-stoppers, the advanced material offers a simplified application in which the procedure of measuring and cutting rubber can be avoided and the adhesive is not needed anymore. The advanced waterproofing material offers better performances and simplifies the application process, especially for solving the water seepage under high hydrostatic pressure.