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BIOMASS WASTE COATING SOLUTION: A WATERPROOFING COATING FOR BUILDING APPLICATIONS

By: Noor Syafeekha Mohamad Sakdun, Ts. Hafizah Muhamad Azlan and Nurasini Tutur

Every year, between September to February, Malaysia experiences heavy rainfalls due to the seasonal monsoon thus causing excessive flooding especially on the East Coast of Peninsular Malaysia. Many structures, mostly houses were affected by the flood and resulting in extensive building damage and loss of property. Therefore, precautions are essential to extend the service life of the structure, especially concrete structures. One such measure is the application of a waterproofing coating. Silica Gel 60 and Cellulose Nanofibres (CNFs) coating solution is a waterproofing material used on concrete surfaces for building protection. Concrete is a porous material where water can permeate easily into the concrete and cause a decrement in the durability of concrete. By applying a layer of special coating containing Silica Gel 60 and CNFs, the waterproof coating can create an impermeable layer on the concrete surface and prevent water ingress inside the concrete. It will infiltrate into the concrete and will fill the voids in the concrete.

This product is environmentally friendly. The silica gel 60 and CNFs which are produced from industrial waste and biomass waste were used as the recycled material and this product also use green solvent (alcohol instead of acetone). It has been tested on uncoated and coated concrete and has proven results in engineering evaluations. This is due to the coating solution providing a near superhydrophobic layer surface and only leaving a little stain of water droplets on the coated concrete. As a result, the coated concrete absorbed significantly less amount of water by capillary action which means less permeable on concrete. Another benefit of using this waterproofing coating is also can protect the concrete from chloride ions that came from seawater which can lead to reinforcement steel corrosion. Also, it can reduce water and chemicals used for surface cleaning and repair. This innovation has won a gold medal at PIID 2021 and a silver medal at IDEX 2021.

