# 3rd Phase: The Effect of Paraffin Wax in the Impermeabilization

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In this work polymers and PCMs such as paraffin and modified paraffin have been used to investigate their effectiveness of waterproofing and resistance to chemicals versus commercial sealers. The hypothesis was that modified paraffin and paraffin used to waterproof concrete blocks will have a higher capacity to seal and resistance to chemicals than commercial sealers. Paraffin and commercial sealers were applied to concrete blocks and left to dry outdoors for 48 hours for the curing process, gripping and adhesion of products. The 'drop let' test and the resistance to chemicals were performed. Treated blocks were placed outdoors to assess how weather conditions affect the strength of the paraffin versus commercial sealers. Water and cleaning solutions were left for 30 minutes over the visible layer created by paraffins and commercial sealers. Paraffins formed a thick layer, while the sealers formed a thinner one. Results showed that water poured on the blocks didn’t pass either type of layer and samples with paraffin dispersed and spreaded water. In sealers water stayed in the same place. Untreated blocks absorbed everything that was placed on their surface. Chemicals like bleach and sodium hydroxide didn’t penetrate the layer, with the exception of bleached sealer B. All products were effective in waterproofing, but paraffin exceeded the waterproof effectiveness and chemical resistance. However, sealer B didn’t withstand chemicals since it discolored the surface. One may waterproof concrete using paraffin. Even when removing paraffin layers, nanoparticles continue the waterproofing process. The overall outcome of this experiment supports the hypothesis.

**Awards Won:**