Abstract

Eternit and Momentive create a development partnership to investigate water-repellent treatments for fiber cement roofing and the replacement of an offline immersion process by controlled inline spray application. Laboratory screening included a hydrophobically modified acrylic copolymer, a silane–siloxane emulsion, silane–siloxane blends with polydimethylsiloxane (PDMS) or nitrile-functional silane, octyl-functional silane, and silicone emulsions with different functional groups. Formulations containing approximately 3 wt.% active material were applied to fiber cement panels, and water repellence was assessed visually and by contact-angle measurement. Three panels were used for each visual assessment; the available project records do not report replicate contact-angle measurements or standard deviations. The acrylic copolymer formed a continuous film and was excluded from further evaluation. Among the evaluated treatments, the silane–siloxane emulsion alone showed the most persistent response during outdoor exposure: the reported contact angles were 148.6° after 24 h, 123.0° after 15 days, 135.9° after one month, 137.7° after two months, 93.2° after three months, 91.2° after six months, 90.7° after nine months, and 99.0° after 12 months. The combinations with PDMS and nitrile-functional silane decreased to approximately 68° and 35°, respectively, and therefore did not show equivalent durability. Industrial trials indicated that inline spray application reduced process-water consumption by more than 61% relative to immersion and enabled direct control of solids content, flow rate, line speed, and applied mass. Water-vapour permeability was not measured; preservation of breathability remains a design rationale to be verified experimentally.