Claims:

1. A method for establishing a waterproofing bond with post-cast concrete, comprising:

applying a waterproofing bonding coating composition onto a substrate, to establish a waterproofing bond for concrete that is subsequently cast against the substrate, wherein the waterproofing bonding coating composition is an aqueous synthetic polymer emulsion system comprising: (i) at least one film-forming synthetic polymer, having an average particle size in the range of 5 to 150 nanometers, present in an amount of 50% to 100% based on total dry weight of the aqueous synthetic polymer emulsion system; and, optionally, (ii) a surfactant in the amount of zero to no greater than 1% based on total dry weight of the aqueous synthetic polymer emulsion system;

allowing the waterproofing bonding coating composition to dry and form a waterproofing bonding coating layer; and

casting concrete against the applied waterproofing bonding coating layer to form post-cast concrete and allowing the post-cast concrete to harden against the waterproofing bonding coating layer,

wherein the at least one film-forming synthetic polymer is selected from the group consisting of acrylate, acrylate with reactive functionality, polyvinyl acetate, acrylate/vinyl acetate copolymer, acrylate/styrene copolymer, acrylate/silicone copolymer, acrylate/polyurethane copolymer, acrylate/epoxy copolymer, and mixtures thereof.

2. The method of claim 1 wherein the substrate is selected from the group consisting of formwork, a building foundation surface, a building wall surface, a waterproofing membrane established by application of a previous coating composition or a rollable/unrollable sheet-form membrane, a civil engineering surface, and any combination of the foregoing substrates.

3. The method of claim 1, wherein the at least one film-forming synthetic polymer having an average particle size in the range of 5 to 150 nanometers is present in the amount of 80% to 100% based total dry weight of the aqueous synthetic polymer emulsion system.

4. The method of claim 1, wherein the waterproofing bonding coating composition is applied at a coverage rate of 10-2500 grams per square meter (gsm) based on total dry weight of the aqueous synthetic polymer emulsion system.

5. The method of claim 1, wherein the waterproofing bonding coating composition has glass transition temperature no less than -20°C and no greater than 100°C.

6. The method of claim 1, wherein the waterproofing bonding coating composition further comprises a polymer emulsion selected from the group consisting of fluoroacrylate or fluorinated polymers, copolymer with carboxyl and siloxane functionality, and mixtures thereof.

7. The method of claim 1, wherein the waterproofing bonding coating composition further comprises titanium dioxide, antimony oxide, zinc sulfide, zinc oxide, white cement, organic hollow sphere pigment, or mixtures thereof.

8. The method of claim 4, wherein the waterproofing bonding coating composition is applied at a coverage rate of 30-100 grams per square meter (gsm) based on total dry weight of the aqueous synthetic polymer emulsion system.

9. The method of claim 1, wherein the at least one film-forming synthetic polymer comprises silane functional groups.

10. The method of claim 1, wherein the waterproofing bond between the waterproofing bonding coating layer and the post-cast concrete is between about 0.53 and about 8.76 Newton per millimeter, when tested in accordance with modified ASTM D903-98 (2017), wherein the testing procedure is modified by casting concrete against a waterproofing bonding coating layer to form the bond between the waterproofing bonding coating layer and concrete and using a peel rate of 100 mm

per minute, whereby the waterproofing bonding coating layer is peeled away from the concrete after the concrete is allowed to harden.

11. The method of claim 1, wherein the at least one film-forming synthetic polymer comprises the acrylate with reactive functionality and, wherein the reactive functionality is at least one of hydroxy group(s), acid group(s), silane group(s), or siloxane group(s).

12. The method of claim 1, wherein the surfactant is not present in the waterproofing bonding coating composition.

13. A waterproofing bonding coating composition comprising: an aqueous synthetic polymer emulsion system comprising: at least one film-forming synthetic polymer present in the amount of 50% to 100% based on the total weight of the aqueous synthetic polymer emulsion system, wherein the average particle size of the at least one film-forming synthetic polymer is in the range of 5 to 150 nanometers; and, optionally, a surfactant in the amount of zero to no greater than 1% based on total weight of the aqueous synthetic polymer emulsion system, wherein the at least one film-forming synthetic polymer is selected from the group consisting of acrylate, acrylate with reactive functionality, polyvinyl acetate, acrylate/vinyl acetate copolymer, acrylate/styrene copolymer, acrylate/silicone copolymer, acrylate/polyurethane copolymer, acrylate/epoxy copolymer, and mixtures thereof.

14. The waterproofing bonding coating composition of claim 13, wherein the at least one film-forming synthetic polymer has an average particle size in the range of 5 to 150 nanometers and is present in the amount of 80% to 100%.

15. The waterproofing bonding coating composition of claim 13, wherein the surfactant is not present in the composition.

16. The waterproofing bonding coating composition of claim 13, wherein the at least one film-forming synthetic polymer comprises silane functional groups.

17. A waterproofing membrane comprising: a carrier layer; a pressure-sensitive adhesive layer; and a waterproofing bonding coating layer formed from the

coating composition of claim 13, wherein the waterproofing membrane does not include a removable release sheet.

18. The waterproofing membrane of claim 17 further comprising a layer of particles partially embedded on a surface of the pressure-sensitive adhesive layer, wherein the layer of particles is positioned between the pressure-sensitive adhesive layer and the waterproofing bonding coating layer formed from the coating composition of claim 13.

19. The waterproofing membrane of claim 18, wherein the layer of particles is selected from the group consisting of cement, white cement, calcium carbonate, silicate sand, sand, amorphous silica, slag, alumina trihydrate, alumina oxide, bottom ash, slate dust, granite dust, acylate resin and other polymer synthetic particulate, or mixtures thereof.

20. The waterproofing membrane of claim 18, wherein the particles have an average diameter of 50-450 microns.

21. The waterproofing membrane of claim 17, wherein the at least one film-forming synthetic polymer has an average particle size in the range of 5 to 100 nanometers and is present in the amount of 5% to 100%, and the pressure-sensitive adhesive is selected from the group consisting of butyl rubber, polyisobutylene, styrene-isoprene-styrene (SIS), styrene ethylene-butylene-styrene (SEBS), styrene-butadiene-styrene (SBS), styrene butadiene rubber (SBR), amorphous polyolefin (APO), or mixtures thereof.

22. A waterproofed substrate comprising the waterproofing membrane of claim 18.