TECHNICAL BULLETIN – TB091

BONDING TILES TO HK EPOXY SEAL MEMBRANES

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INTRODUCTION & SCOPE

H.K. Epoxy Seal Pty Ltd manufactures and distributes flexible epoxy and a single-component aliphatic polyurethane waterproofing membrane for internal wet areas. It also has a development two-component aliphatic polyurethane membrane proposed for similar applications.

ARDEX Australia have carried out adhesion testing using selected ARDEX ceramic tile adhesives applied over the H.K. Epoxy Seal membranes to determine their suitability in accordance with Australian Standard 4992.2 - 2006

Internal Reference TS0423.

PRODUCTS EVALUATED

Waterproof Membranes, ex. H.K. Epoxy Seal Pty Ltd

HK1 – 100% solids flexible epoxy membrane used in under tile wet area application.

HK2 – 2-Part aliphatic polyurethane, to be used as an alternative to HK1 (development product).

When applied directly to the concrete test block, the coating blistered badly, and this test was abandoned. A second set of test blocks was prepared using a solvent-based polyurethane primer, and then a 1mm film of HK1 was after 4 hours. After a further 4 hours, small blisters still appeared on HK2, although this time, the blisters stayed smaller in diameter. At the time of testing, the concrete slabs used in the tests were notably damp, which may have caused moisture to react with HK2.

HK3 – 1-part solvent-based, moisture-cured polyurethane membrane.

The above membranes were tested with the various ARDEX adhesives for tensile bond strength in accordance with Australian Standard 4992.2 - 2006

HK1 - Ardex MPP, Optima and Abaflex.

Dry tensile bond strength was measured on a membrane applied by HK and cured for some time before testing.

Wet tensile bond strength was measured when the adhesive had been applied after the membrane had been allowed to cure for 24 hours and 7 days.

HK2 - Ardex Opima, Abaflex and 1 Part Isoflex

HK3 - Ardex Optima, Abaflex and 1 part Isoflex

TESTING PROCEDURES

Several panels of standard concrete slabs were coated with H.K. Epoxy Seal waterproof membranes by Sean Herbert Klempert, General Manager of HK Epoxy Seal, in the following manner: -

HK1 – Applied as a 2 mm film.

HK2 - Applied on concrete (primed with solvent-based PU primer)

HK3 - Applied on concrete (primed with a solvent-based PU primer).

A second series of the HK3 membrane was prepared, and sand was broadcast over the surface while the coating remained wet.

The H.K. waterproofing membranes were allowed to cure for 24 hours and 7 days prior to bonding standard test specimen using the ARDEX adhesives.

The ARDEX adhesives were allowed to cure for a further 7 days before the dry bond strengths were determined. The wet bond strengths were determined after the adhesive had been allowed to cure for seven days and then immersed in water for 21 days.

RESULTS

HK1: MPP and Optima showed good adhesion to HK1 for dry, internal conditions.

Only Optima met the tensile bond strength requirements of AS 4992 for applications subject to immersed or wet conditions.

Improved results were achieved when the tile adhesives were applied after 24 hours of curing HK1.

HK2: Optima and 1-Part Isoflex met the tensile bond strength requirements for dry and wet conditions when applied over HK2 after the HK2 had been allowed to cure for 7 days.

Better adhesion results were obtained when the adhesive was applied after the HK2 had cured for 7 days. This further curing of HK2 allows the solvents to evaporate and, therefore, prevent them from interfering with the tensile bond strength.

Further tests may need to be done to verify the blistering of HK2, which may, in the long term, affect the integrity of the adhesive bond.

HK3: Generally, marginally better adhesion results were obtained for HK3 than HK2.

Both 1-part Isoflex and Optima passed the tensile bond strength requirements for wet and dry area application on neat HK3.

The results for HK3 with broadcast sand did not appear consistent as the sand actually interfered in getting good adhesion results. The failure mode occurred in the sand-HK3 interface.

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