

香港試驗有限公司

HONG KONG TESTING CO., LTD.

Room 205, 2/F., Fuk Shing Commercial Building., 28 On Lok Mun Street, On Lok Tsuen, Fanling, N.T., Hong Kong.

Tel: (852) 2692 2171 Fax: (852) 2691 4874 Email: info@hktesting.com.hk

Website: www.hktesting.com.hk

香港新界粉嶺安樂村安樂門街28號福成商業大廈二樓205室 電話: (852) 2692 2171 傳真: (852) 2691 4874

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Method Statement for Pull-off Test

In-House Method : MIS-PHY-0101 (Method 1)

1 Apparatus and Accessories

- 1.1 Saw cutting machine.
- 1.2 Adhesive, quick-hardening two-component epoxy adhesive or equivalent.
- 1.3 Aluminium dolly with size 45 x 95mm or 50 x 50mm with thickness of at least 30mm.
- 1.4 Vernier calipers with a reading inaccuracy of not more than 0.1mm.
- 1.5 Pull-off tester. (inaccuracy < 2%)

2 Procedure

2.1 Execution of the test.

2.1.1 Cutting the wall tile / mortar by saw cutting machine carefully without damaging the test specimen, to the depth of 10-15mm in the concrete substrate, with an inaccuracy of not more than 5mm.

2.1.2 Applying the dolly

Clean, degrease and dry the side of the dolly onto which the adhesive is to be applied. Apply a thin layer of adhesive to the surface of the test specimen in such a way that the adhesive forms a completely filled layer between the dolly and the substrate. No adhesive shall penetrate into the clearance made by the saw-cutting. Place the dolly onto the face of the cutted section in such a way that the centre of the dolly coincides with the centre of the cutted section. Slightly press down the dolly and fix the dolly in position to avoid any movement. Allow the adhesive to harden in accordance with the manufacturer's instruction.

2.1.3 Setting up the pulling equipment.

The pulling equipment and its accessories shall be used in accordance with the manufacturer's instructions. Place the pulling equipment perpendicularly on the cutting surface and concentrically over the dolly. Position the instrument in such a way that its position will not change during the test. Take all action necessary to ensure that the test results will not be influenced by the weight of the pulling tool.



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2.1.4 Applying the load

Increase the load continuously and evenly in time at a rate of $0.1 \pm 0.01 \text{ N/mm}^2$ per second until failure occurs.

Determine the sectional area of the test specimen at the rupture face as the average result of measurements taken perpendicularly to each other, with the vernier caliper.

2.2 Determination of the type of failure

On the basis of a visual assessment, determine the mode of failure of the test specimen.

The following modes of failure are distinguished :

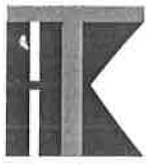
- adhesive layer failure : failure in the the adhesive layer;
- adhesive/tile failure : failure in the interface between adhesive layer and tile;
- tile failure : failure in the tile specimen;
- tile / mortar failure : failure in the interface between tile and mortar layer;
- mortar failure : failure in the mortar layer;
- interface failure : failure in the interface between mortar layer and concrete substrate;
- substrate failure : failure in the concrete substrate

If there is a mix of these types of failure, make a visual assessment of the rupture face to estimate the surface area percentage per type of failure.

2.3 Validity of the test result

A test is not valid if one or more of the following cases apply :

- adhesive layer failure in the whole or part of the rupture face;
- The specimen surface appears to have been cutted askew with a deviation of 10° or more relative to the surface of the mortar layer.



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2.4 Calculation

Calculate the bond strength, rounded off to 0.001MPa (N/mm²), with the following formula :

$$f_b = F_b / A$$

Where :

f_b is the bond strength of the test specimen, to the nearest 0.001MPa (N/mm²);

F_b is the failure load, to the nearest 0.01 kN;

A is the sectional area of the test specimen, to the nearest 0.1mm².

3 Report

The report should contain the following data and information :

- a) Report serial No
- b) Customer
- c) Location
- d) Works Instruction No
- e) Sample No
- f) Date received
- g) Date test started
- h) Date test completed
- i) The calculated bond strength
- j) The failure load
- k) The type of failure
- l) The type of mortar
- m) The age of the mortar at the time of testing (if know)
- n) Pulling equipment information
- o) The Sectional area of the test specimen