

GEPOLYMERIC MATERIALS AS THIN LAYER COVERINGS AND REPROFILATION LAYERS

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A research Under the aegis of The Glass and Ceramics Institute VŠCHT Prague and The Department of Construction Technology ČVUT FS in Prague concerning utilization of flying ashes from furnaces has been begun.

The research of how flying ashes could be practically used as thin layer coverings and reprofilation layers is also included in this project. It is still an unknown quantity in these days, because there has been almost no reference to the flying ashes utilisation in this sphere of the construction industry until now.

The aim of this work is to find an optimal composition of flying ashes incl. activators and suitable adhesion bridge.

The whole research is a complex of many experiments following one another, and can be described as follows: blending of the given mixture sample, application of the mixture onto the current surface while using

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various penetration layers, boring the sample and pasting the tear disc, determining of the peel force. The set time intervals are observed to between the component processes.

On the basis of the gained results, it is already now possible to say, that the examined material has sufficient adhesion to be practically used.

1. Introduction

Utilization of flying ashes for thin layer coverings and reprofilation layers is still an unknown quantity in these days, because there has been almost no reference to the flying ashes utilisation in this sphere of the construction industry until now. But it is safe to say already now, that there is definitely a great potential in this possibility of flying ashes utilization in practice in future.

We carry out strenght tests and proof tests by the means of the so-called peel test. The instrument COMTEST OP4 (picture on the right) is employed to make this peel test. Only a small amount of these tests have been carried out because of great technological and time demandingness. The set of these just carried out tests has been employed to analyse the gained results.



If a useful application of POPconcrete mortar for the adhesion bridges realisation, reprofilation and other utilization in construction practice (subsurfaces of upper floor layers) are our intention, it is necessary to get the required (suitable) tensile strength values. The first and also the recent basic tasks are the sequential definiton of components, which compose the POPconcrete, their ideal dosing and the subsequent mixture preparation. After fulfilling these tasks it will be possible to start the application outside the laboratory environment.

2. Required Qualities of Reprofilation Materials

Reprofilation materials have to fit to these requirements: high retaining to the base, frost-resistance, water-resistance and low absorbability, minimal content changes in consequence of humidity and temperature changes, minimalization of contraction cracks and resistance against the chosen chemicals.

3. Procedure of Samples Preparation

The first phase is the preparation of an alcalic activator. This activator enables the flying ashes reaction while a geopolymeric product of unigue qualities gets created.

The second phase is the preparation of the POPconcrete peel test coats and their thin layer application onto a concrete slab, which is covered with various penetration coatings (water, water glass, sokrat).

We leave the deposited peel test coats in the laboratory at the temperature of the place for 28 days. Than we bore holes we need for the peel test.

4. Preparation of the Ready Samples for Laboratory Tests

28 days after dabing the peel test coats onto the concrete base, we bore holes with the core drill and we prepare the base for pasting the tear disc, which we glue to the base. After it, we put the prepared samples to the peel test.

5. Peel Tests

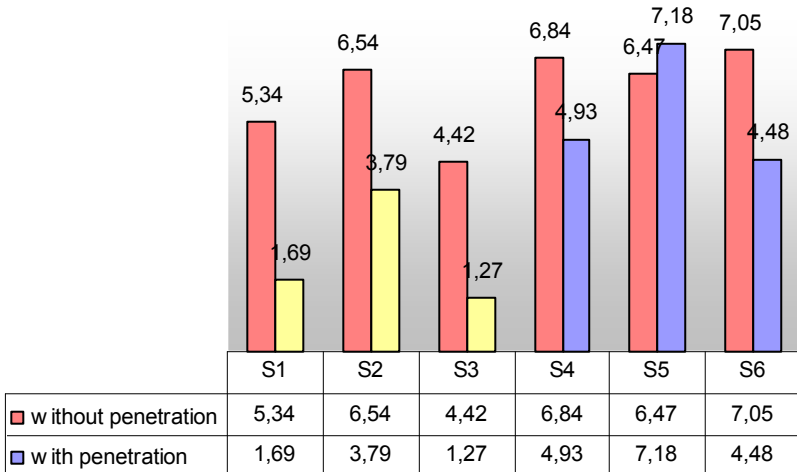
We carry out the propper peel tests after the glue gets dry (7 days). We screw the peel instrument (COMTEST OP4) on the glued-on tear disc. The screw thread tightens automatically after the test starting and the sample gets torn.

The suitability of the materials and operating sequence used for the test, as well as the suitability of the used adhesion bridge and composition of the peel test coat are determined by the tear (breaking) point.

6. Results

There are 6 results of the tests illustrated in the graph on the next page (the marking of the peel test coats S1 to S6 is only exemplificative).

The peel test coats S1, S2 and S3 got the special penetration glass water coating and the coats S4, S5 and S6 were daubed with the water penetration coating. The proven results show that higher strength was acquired without the use of penetration. The stated values represent the retraction forces in [kN].



7. Conclusion

Following the gained results it is possible to say already now, that the examined material reaches sufficient cohesion for the practical use. Penetration with water appears to be the most suitable cohesion bridge. However, this penetration bridge in itself limits cohesion in comparison with applying the peel test coat onto a base without any adhesion bridge.

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