

Comparative Study of the Mechanical and Chemical Characteristics of GCK and ZIJI Cements

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Date of publication (dd/mm/yyyy): 28/08/2023

Abstract – This work talks about the comparative study of the mechanical and chemical characteristics of ZIJIN and GCK cements produced and used in the great KATANGA. Indeed, the field of construction is in full development in this region; thus, the production of good quality cement in this part of the country will allow users to trust these two cement industries. In order to properly conduct this study, we carried out several chemical and mechanical analyzes on ZIJIN and GCK cements; the latter were carried out on bricks made from a mixture of cements associated with a type of material (crushed sand, fine sand and ferruginous laterite) poured into 16x32 test specimens, after the mortar had matured for 28 days, we carried out our bending and compression analysis tests using a GLP equipment type device (cube press). The main objective of these tests is to define the resistance of the brick obtained from a purely chemical mixture (crushed sand with cement, fine sand with cement as well as ferruginous laterite with cement). Thus, we obtained at 28 days some values of the compressive strengths of bricks made from the mixture of mortars containing only maximum proportions of materials and cements contained in different bricks according to the data below:

- A mixture of 3 Volumes of ZIJIN cement with 1 Volume of laterite gives a compressive strength of 4.9MPa.
- A mixture of 3 Volumes of ZIJIN cement with 1 Volume of fine sand gives a compressive strength of 4.5MPa.
- A mixture of 3 Volumes of ZIJIN cement with 1 Volume of crushed sand gives a compressive strength of 13.9MPa.
- A mixture of 3 Volumes of GCK cement with 1 Volume of laterite gives a compressive strength of 5.3Mpa.
- A mixture of 3 Volumes of GCK cement with 1 Volume of fine sand gives a compressive strength of 4.9Mpa.
- A mixture of 3 Volumes of GCK cement with 1 Volume of crushed sand gives a compressive strength of 5.4 Mpa; After mechanical and chemical analyzes we judged that; From the mechanical point of view, the ZIJIN cement is more appreciable than that of GCK, because the bricks based on the crushed sand mixed with the ZIJIN cement showed a resistance of 13.9MPa compared to that of GCK 5.4MPa. By taking the average of the stresses of the bricks based on ZIJIN, we had a stress of 4.55MPa and based on GCK the average is 3.522MPa. This confirms that ZIJIN cement has good mechanical strength than that of GCK. From the chemical point of view, the analysis shows us that the ZIJIN cement, with regard to the chemical elements, it has a large quantity than the GCK cement.

Keywords – Comparative Study, Mechanical, Chemical, GCK Cements, ZIJIN Cements, Field of Construction.

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