



## **Mechanical properties of mortar specimens prepared from experimentally burnt impure limestones: effect of raw material characteristics and burning conditions**

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Recent study focused on the effect of raw material characteristics of impure carbonate rocks and of their burning conditions on physical / mechanical properties of experimentally burnt natural hydraulic lime / natural cement. Four types of limestone that were historically employed for production of inorganic binders were burnt at 1000, 1100, and/or 1200°C, keeping the peak temperature for 6 hours. Mortar specimens prepared from the experimentally prepared binders were cured in a climatic chamber for 7, 28, 90, and/or 180 days. Then, their mechanical properties (flexural and compressive strengths) were determined. In contrast to our expectations, no direct relationship between increasing content of non-carbonate fraction and burning conditions on improvement of mechanical properties was observed. This fact might be explained by additional effects such as differing microfabrics of the raw material, specifically of spatial distribution of carbonate and non-carbonate mineral phases, which controls formation of new phases during burning below sintering point and therefore influences overall hydraulic character of prepared binders. The study thus shows importance of detailed knowledge not only of chemistry, but also of mineralogy / rock microfabric of raw materials used for burning of inorganic binders below sintering point, and of physical / mechanical properties of experimental mortars for the final evaluation of specific types of limestones suitable for natural hydraulic lime and/or natural cement.