Optimization in gypsum blocks production: analysis of changes in waterproofing properties

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The construction market has at its disposal more and more technical solutions in sealing materials that allow cost reduction and short time execution for construction companies. Among these solutions are the so called gypsum blocks. In spite of their countless advantages when it comes to their use as masonry sealing material, there are limits to the use of gypsum blocks: due to their low resistance to deterioration by rain, their use as external sealing is not recommended. Therefore, the aim of the present work was the development of waterproofing gypsum with suitable performance for outdoor construction sealing materials. The composites were obtained according to NBR 12128/2017 with water/gypsum ratio 0.7. Waterproofing admixtures (CS - fatty acid salt) and dispersing admixtures (MT, PA, SI), both in contents varying from 0.5% to 2.0% and gypsum were homogenized and dispersed in the water. Waterproofing tests, water absorption by total immersion test, compressive strength, XRD and SEM measurements were performed for characterization of the raw materials and composites. SEM analysis exhibit characteristics morphological of gypsum. XRD identified the crystallographic planes of the gypsum. Waterproofing tests were carried out to determinate the composition that provides the major absorption time in both faces (top and bottom). A composition with 1.5% CS 1.5% PA, 1.5% MT and 5.0% SI revealed the best result in top face (246.33 s on top face and 25.33 s on botton face) - denominated composition 1. This and other composition (with best result in botton face - 1.5% CS, 2.0% PA, 1.5% MT - composition 2) were submitted to absorption by total immersion test and compressive strength test. The results show that a composite formed by composition 2 (without SI) provides the lower water absorption (29.67 ± 0.13 %) (smaller than the untreated samples - 37.13 ± 0.32%). However, its compressive strength decreased from 8.14 ± 0.22 MPa (untreated specimens) to 4.32 ± 0.05 MPa. Preliminary results indicate that the gypsum with 1.5% CS, 2.0% PA, 1.5% MT composite decreased the water absorption for gypsum. Therefore, the methodologies used in this work are promising to obtain gypsum composite with important hydrophobic characteristic.