

Review of the rheology of cementitious materials focused on their use in Additive Manufacturing processes

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It is also worth to mention that there is not yet a systematic way to develop mixtures specifically for printing purposes. Most of the projects use a so-called printable concrete or mortar, what in fact is a mixture that, through a trial and error process, they manage to extrude. Only the researchers at Loughborough University have set a series of tests that can be used to check the viability of the material.

8. THE PATH FORWARD FOR THE DEVELOPMENT OF THE FIELD

Based on the actual situation, the success of the Additive Manufacturing processes in the concrete world goes through the study of the process itself, the material and the elements that will be so produced.

It is nonsense to try to access the market with products that are similar to the existing ones but much more expensive due to their production process, so it is critical to look for products with a large added value and that can get benefit of the characteristics of the AM technology, as they can be architectural elements that, together with their functionality, are thought to provide an aesthetic value which would be enhanced through the personalisation of the design.

Referred to the material, if a wide market is expected for the product the development of the printing mixtures must be focused on criteria that ensure the printable properties. This way the materials would be optimised to meet the conditions they will face as it is done nowadays with common concrete, getting printable chloride resistant concrete for maritime environments or printable erosion resistant concrete.

The way to get the results exposed in the upper lines is not to develop a printable concrete or mortar, but to design a process for the development of as many different materials as possible, and this goes through the knowledge of the effect of each component of the material.

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