

Note on further development of Cemfree since trials with Crossrail

The development of the Cemfree concept has progressed substantially since the trials with Crossrail were carried out. Much greater understanding about the fundamental as well as technological properties have been gained with the subsequently increased capacity for various applications in the construction sector.

The portfolio of the mix designs increased significantly, addressing a far greater range of workability characteristic (from slump S1 to 500mm flow) as well as compressive strength ranges (20-60 MPa) depending on the intended application.

A pumpable Cemfree concrete has been developed, successfully trialled and is now available.

Much progress has been achieved in the area of standardisation. A Publically Available Specification (PAS 8820:2016 Construction materials – Alkali-activated cementitious material and concrete-Specification) was published in April 2016. A PAS can be regarded as a precursor to a British Standard.

The PAS is the first document enabling performance based specification of concrete with no Portland cement. It specifies a range of properties which should be addressed, including mechanical performance, dimensional stability and durability. The document, with its format, closely resembles a technical Standard and quotes a wide range of British and European Standards relevant to cement and concrete technology.

Currently Cemfree concrete is being tested for all the durability characteristics stipulated in the document. The principle of declaring conformity in terms of the durability tests is based on comparative testing of the concrete based on alkali activation with that of a suitably selected control specifiable against BS 8500. The durability tests include carbonation, chloride ingress, freeze-thaw, sulphate attack and alkali silica reaction – all tested according to BS or ASTM standards.

When the testing is completed it will be possible to specify Cemfree concrete against conforming exposure classes stipulated in BS 8500.

Dr Martin Liska
R&D Manager, David Ball Group

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